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The OIL WEEKLY

OIL and GAS ENGINEERING

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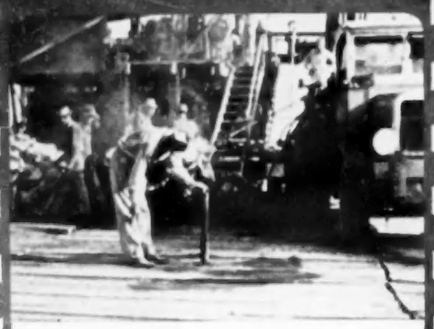

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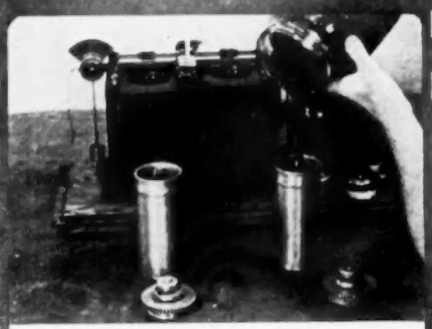

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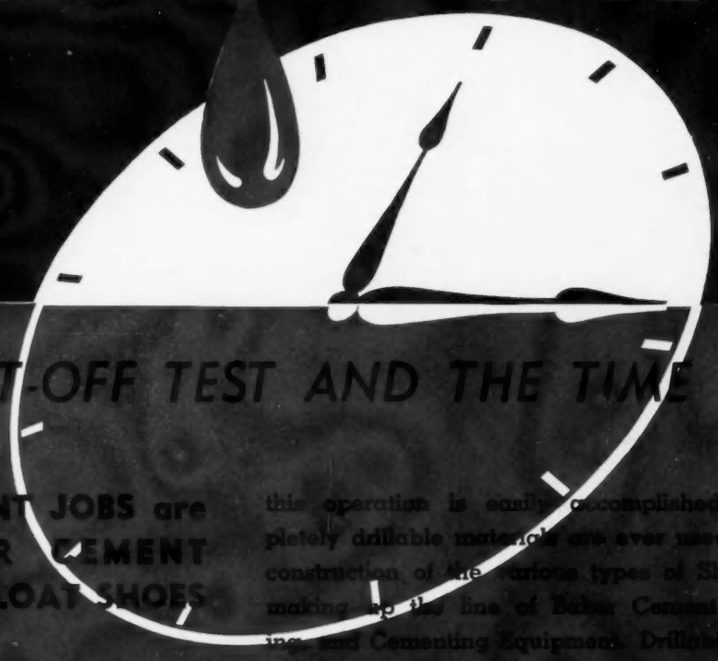

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For Complete Details, See Pages 223-225 in the 1940 Composite Catalog

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Looking Ahead

WITH THE EDITOR

WATER FLOODING stands high in the list of secondary conservation measures. Records are available to show that a scientifically conducted flood may recover more oil within four or five years than has been produced from many a structure during its entire previous productive life. Several examples of this nature are coming to light in Nowata County, northeastern Oklahoma, where 5000 acres of old stripper-well territory is being flooded. The production of the county has nearly doubled since 1934, its output having increased from 2,254,340 to 4,351,122 barrels annually as a result of water flooding.

Typical among the Nowata County water-flood projects proving conservation of oil can be practiced successfully in a field where the original wells had become strippers with an output of possibly a barrel or two daily, is one near Coody's Bluff. This operation is to be described in detail in an early issue of THE OIL WEEKLY, showing the procedure used by the owner since inception of the flood.

UNITED STATES IMPORTS of petroleum and its products for domestic consumption that were subject to excise taxes averaged 165,982 barrels daily during the first 4 months of 1940. This represents an increase of 123 percent over the same period of 1939, and clearly indicates the effect of reducing these taxes in the trade agreement with Venezuela.

There is no indication that the volume of imports will decline, taxable imports during April averaging 176,658 barrels daily, a gain of 85 percent over the same month a year previous. These figures indicate that total imports of the nation will be extremely large during 1940.

UNITED STATES EXPORTS, meanwhile, have declined materially. During the first 3 months of 1940, total exports averaged 351,650 barrels daily, a decline of 22 percent under the same period of 1939.

Thus the United States oil industry is having to absorb 70,000 barrels per day more imports in its domestic markets while exporting 103,000 less barrels. When the country is having difficulty in retarding its production to consumption levels, this additional 173,000 barrels daily is a very sizeable quantity.

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THE OIL WEEKLY

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SPECIALIZED OIL JOURNALS

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The Oil Man's Calendar

JUNE	
20–21	Pennsylvania Grade Crude Oil Association, Bradford, Pa.
21–22	Kentucky Oil & Gas Association, Lexington.
29	American Petroleum Institute, Illinois Basin Chapter, Evansville, Ind.
SEPT.	
9–13	American Chemical Society, Detroit.
18–20	National Petroleum Association, Atlantic City, N. J.
OCT.	
7–10	American Gas Association, Atlantic City, N. J.
7–11	National Safety Congress and Exposition, Chicago.
16–18	Independent Petroleum Association of America, Dallas.
31 Nov. 2	Texas Mid-Continent Oil & Gas Association, Ft. Worth.
NOV.	
11–15	American Petroleum Institute, Chicago.
1941	
APR.	
24–25	National Petroleum Association, Semi-Annual Meeting, Cleveland.

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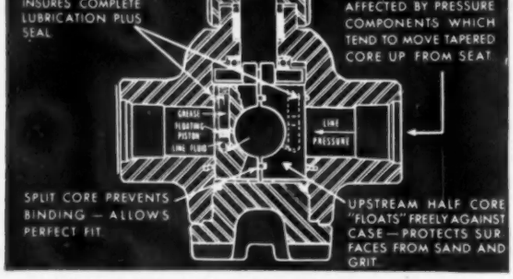
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THE OIL WEEKLY

JUNE 17, 1940

VOLUME 98 NUMBER 2

The Week's Panorama

THE bidding up of oil company stocks following Italy's entry in the war reflected expectations of increased oil exports to the Allies, with their supplies from the Far East and Near East made less accessible. But companies operating in South America were most favored, under the assumption that Venezuela and Colombia would benefit more than the United States from British and French orders.

• • • Curtailment of oil exports to warring countries has resulted primarily from the sharp decline of civil consumption, as evidenced by figures from London. In March there was a further slump in new motor vehicle registrations in Great Britain. Only 14,590 mechanically propelled road vehicles of all classes were registered during the month, as compared with 56,821 in March, 1939. Passenger car registrations showed the heaviest decline, having dropped to 6,611 from 39,264.

• • • Despite seasonally increasing consumption, no important progress is being made in cutting down the excessive stocks of gasoline, and prices are showing no improvement. Storage came down below 100,000,000 barrels for the first time this spring in the week ended June 8. But after the 882,000-barrel decrease to 99,471,000 barrels, the stocks still were over 16,000,000 barrels greater than a year previously. Most of that margin over a year ago is surplus gasoline, for the stocks then on hand promoted market weakness and the intervening year has brought only a small increase in demand.

• • • Further new records in heating oil consumption are in prospect, as the number of oil burners in use steadily increases. In the first 4 months of this year, manufacturers shipped 51,649 burners, compared with 37,723 in the corresponding months last year. Shipments in April, 1940, totaled 14,394 units, against 10,640 in April, 1939.

• • • Progress is being made in building up stocks of light fuel oils for use next winter. A million-barrel addition in the week ended June 8 increased the supply to 30,609,000 barrels, a total 6 percent greater than that of 28,896,000 barrels on hand a year previously.

• • • Disruption of shipping by Europe's intensified war apparently has been chiefly responsible for recent mark-downs of the prices of heavy fuel oils. The declines also may reflect slowing down of industrial production in some industries since the commencement of the German offensive.

However, a stabilization or improvement of the heavy fuel oil market is promised, as increased industrial activity is indicated by the national defense program.

• • • The past week brought evidence of increased weakness of California crude prices. Major company postings were shaded 10 cents a barrel in the Los Angeles basin spot market, as producers lost markets in consequence of the closing down of plants that account for 40 percent of the independent refining capacity of the district. The companies operating those plants normally are the leading buyers in the spot market. Further indication of uncertainty has been the action of several major purchasers in giving notice of cancellation of all 30-day purchase contracts, effective June 30. After that date, those buyers will be free to discontinue purchases upon giving 24 hours' notice.

• • • Despite the decline of prices of stocks and commodities since Europe's war became violent, business in the United States has held up comparatively well. Retail trade has been well sustained, and sales of automobiles have continued sizeably larger than in 1939. Barron's index of general business activity currently is above 80, the latest weekly change having been upward. A year ago it was under 70.

• • • Some oil tankers that are under construction have been modified, in line with the national defense program, from an ordinary commercial character to incorporate features that would make the ships usable for emergency purposes arising from war or threats of war.

• • • United States oil companies that have properties in warring Europe have very little information so far as to whether those properties have been damaged.

The War's Significance

By L. J. LOGAN.

LIKE most other lines, the oil industry of the United States already has been affected materially by the European war, both indirectly and directly. But in coming months the industry doubtless will be influenced even more greatly by developments in the war and by conditions in the United States brought about by the conflict.

Henceforth, as in the past, the war's effect on the oil industry necessarily will be indirect to a considerable extent, with the struggle affecting business in general and with the coloring in the whole business picture determining that in the part occupied by oil. But in the future the war situation likely will affect the oil industry directly to an increased extent, as by causing higher taxes on gasoline and requiring larger facilities for making aviation gasoline.

General Business Situation

The immediate effect of the latest phase of the war, that is, the commencement of the "total war," has been definitely adverse on business in general, although the effect on the oil industry so far has not been appreciable. The United States now appears to be going through a milder form of the panicky experience that it had in 1914-1915 immediately following outbreak of the World War. It is almost as if the present war actually did not break out until the German war machine struck in the Low Countries. For the formal declarations of war last summer were followed by an upsurge in business activity that was completely canceled as far back as several months ago.

The current reaction to the epochal and stupefying events in Europe is a temporary, partial paralysis of industrial and business activity.

Only the steel mills, airplane factories, and other war-related lines have surged ahead as the *blitzkrieg* has flashed across Belgium and Northern France.

Most other lines of industry and business have been retarded. Highly sensitive to significant developments, the stock market and the commodity markets immediately diagnosed the intensified war as having adverse implications. Within a 10-day period in May, prices of stocks tobogganed 25 percent before leveling out. Numerous commodities declined 20 to 25 percent. Wheat, for example, dropped 20 cents a bushel and cotton 2 cents a pound.

Purchasing power in agricultural areas has been reduced through the decrease of market value of the farm commodities, and retail trade consequently has declined to some extent in those districts.

The somber war news has discouraged buying and building of homes, and employment in the building line has been affected.

Purchases of automobiles have been deferred, in view of the increased uncertainties, and with the export markets disrupted, automobile factories have slowed down their hitherto brisk operations.

These developments in the other sections of the economic structure since the furious fighting began may be expected to have a retarding effect on oil consumption unless there is an early recovery of business activity and a bolstering of aggregate consumer buying power. For oil consumption inevitably must be circumscribed by the needs of industry and the buying ability of the consuming public.

Business Upturn Expected

Some economists and business executives are reasonably confident, however, that the generally depressing effects of the present violent warfare will be comparatively short-lived, just as the disruption of business in the United States in the early stages of the World War proved only temporary.

They foresee the ultimate evolution of a business boom in the United States, as the nation begins to supply markets for farm products and manufactured goods that no longer can be supplied by countries crippled, short-handed, and desperately at war. It is predicted, consequently, that employment will arise for hundreds of thousands of American workers within a year from now.

In the opinion of some business analysts, this prospective wartime business boom in the United States is virtually inevitable, now that the European conflict has developed into a grimly-fought, orthodox war, regardless of which side wins and irrespective of whether this country becomes involved as a belligerent.

It is recognized that the war already has set in motion a gigantic armament program in the United States which in itself is comparable with public-spending and relief programs of the past decade in potentialities for at least temporarily stimulating business. To this extent, therefore, the new war already has laid the foundation for a "boomlet," if not a boom.

If Germany should win the war, it is further reasoned, the national defense program doubtless would be expanded enormously, and the possibilities of business stimulation would be multiplied.

However, some are doubtful if the domestic defense program would be sufficient to offset the loss of foreign markets to cheaper manufactured German products. It is to be expected that a victorious Germany would im-

For the Oil Industry

Associate Editor

mediately engage in a widespread product selling campaign, and due to government encouragement and working conditions would be able to produce materials more cheaply than could plants in the United States. Therefore, as soon as the Germans could turn their efforts toward peacetime manufacturing, the United States stands to suffer a recession in export business should Germany win.

If the Allies should win, the business economists deduce, those nations would be confronted with a vast reconstruction job, from which the United States would obtain large volumes of business.

And if the United States should enter the war, all other situations would be dwarfed in potentialities for stimulating business, although the entry necessarily would call for a regimentation of industry and a moratorium on the normal pursuit of business.

If the analysts are correct in the conclusion that the war developments are leading the United States into a business boom, then it may be confidently assumed that improved conditions are in store for the oil industry later this year or early next year.

For the industry's present overall situation is comparatively favorable, despite several handicaps, and a stepping up of general business activity such as that envisaged should stimulate consumption of all oils and thereby promote strong markets for most of the products.

Particularly promising are the prospects for sales of aviation gasoline and lubricants, quality products of the industry. For the war situation may be expected to cause large growth in both domestic and export sales of the high-octane fuel needed in airplane motors. And the indicated stimulation of industrial activity should increase the present lagging demand for lubricating oils on the part of American manufacturers, while the Allies likely will be forced to come to the United States for larger supplies to meet the requirements of the intensified warfare.

Lubricants have been exported in increased quantities since the outbreak of the war, whereas shipments of nearly all other products have declined, and with the war machines and war-related factories using up vast quantities, it may be assumed that the exports, along with domestic consumption, will continue exceptionally large. Domestic use of aviation gasoline has expanded along with rapidly growing travel by air, and although exports have not measured up to expectations since the beginning of the war, increased shipments are indicated by the gradual building up of the air forces of the Allies.

Italy's Entrance

Furthermore, the whole export outlook has been improved by Italy's entrance into the war, as Italian interference with British and French shipping through the Mediterranean is expected to force the Allies to turn to South America for much of their oil and to the United States for larger supplies. While Italy still was nonbelligerent, the British and French were able to obtain most of their oil requirements from their own fields and refineries in the Far East and the Near East, through the Mediterranean. But as early as several weeks ago, when it became apparent that Italy would take up arms against the Allies, such shipments were diverted around the southern end of Africa. However, regular oil shipments over that long route do not appear practicable, with tanker tonnage limited. And expediency is likely to force the Allies to turn to the nearer sources in the Western Hemisphere, despite their reluctance to use foreign exchange for oils heretofore obtained with pounds and francs.

However, Italy's entrance into the war also removed it from the list of United States oil customers, and the country had been buying considerable supplies in the past eight months. No longer can Italian tankers travel between the United States and Italy because the Mediterranean entrance is blocked by the English.

Obviously, the intensified and broadened warfare will necessitate much larger supplies of petroleum products for the Allies than their requirements for the previous lethargic fighting. Not only lubricants and aviation gasoline but also ordinary gasoline, fuel oils, and Diesel oil are being consumed in greatly increased quantities, with the furious fighting on land and in the air accompanied by naval operations from the Norwegian fjords to the shores of the Mediterranean. The Allies will need much oil to maintain the pace that has been set.

In view of the recent developments, therefore, it does not appear that the future necessarily will bring an extension of the past record of comparatively small exports; although shipments might continue to lag if the war should end quickly or slow down materially.

An accompanying table shows the oil export record as it stood at the end of the first 8 months of the war. Within that period, from September through April of this year, exports of all United States crude and refined oils totaled 103,833,000 barrels, which was 13,000,000 barrels, or 11 percent, less than the 116,834,000 barrels shipped out in the corresponding 8 months a

Oil Exports Down Sharply in First Eight Months of War

Figures indicate barrels, except as otherwise noted.

	EIGHT MONTHS PERIOD			MONTH OF APRIL		
	Ending April 30, 1939	Ending April 30, 1940	Percent Change	1939	1940	Percent Change
Item:						
Crude oil	43,317,000	39,692,000	— 8.4	6,222,000	4,262,000	— 31.5
Products:						
Motor fuel	31,721,000	21,888,000	— 31.0	3,663,000	[2]2,075,000	— 43.4
Aviation gasoline (included above)	[1]1,450,000	[2]1,764,000	+ 2.7	323,000	302,000	— 6.5
Kerosene	5,229,000	4,276,000	— 18.2	713,000	399,000	— 44.1
Gas oil and distillate	17,760,000	16,952,000	— 4.6	2,345,000	1,966,000	— 16.2
Residual fuel oil	12,169,000	9,728,000	— 20.1	1,488,000	1,532,000	+ 3.0
Lubricants	6,118,000	9,008,000	+ 47.2	816,000	1,161,000	+ 42.3
Wax (thousands of pounds)	168,901	170,585	+ 1.0	20,092	19,156	— 4.6
Coke (short tons)	126,100	161,200	+ 27.8	23,100	13,500	— 41.6
Asphalt (short tons)	35,400	404,200	.....	3,800	[3]29,400	.....
Miscellaneous	70,000	525,000	+ 650.0	9,000	85,000	+ 844.4
[4]Total Refined Products	73,517,000	64,141,000	— 12.8	9,243,000	[5]7,515,000	— 18.7
Total Crude and Products	116,834,000	103,833,000	— 11.1	15,465,000	11,777,000	— 23.9

[1] September, October, November, 1938, not included. [2] September, 1939, not included. [3] Beginning January, 1940, includes both manufactured and unmanufactured asphalt; only unmanufactured asphalt being previously shown. [4] Note the sum of above figures, some of which do not indicate barrels. [5] Exclusive of 10,000 barrels exported from non-contiguous territories, but inclusive of 955,000 barrels shipped from United States to territories. [6] Includes benzol, 1,000 barrels in April, 1940.

Above figures from Bureau of Foreign and Domestic Commerce.

year earlier. Crude oil exports were down 8 percent, from 43,317,000 to 39,692,000 barrels, while refined products in the aggregate showed a decrease of 13 percent, from 73,517,000 to 64,141,000 barrels.

The most important loss of export business has been that in shipments of gasoline, which were 10,000,000 barrels, or 30 percent, smaller in the first 8 months of the war than in the comparable months a year before.

Exports of heavy fuel oils have declined sharply, but those of light fuel oils and kerosene have decreased only moderately.

Higher Taxes Ahead

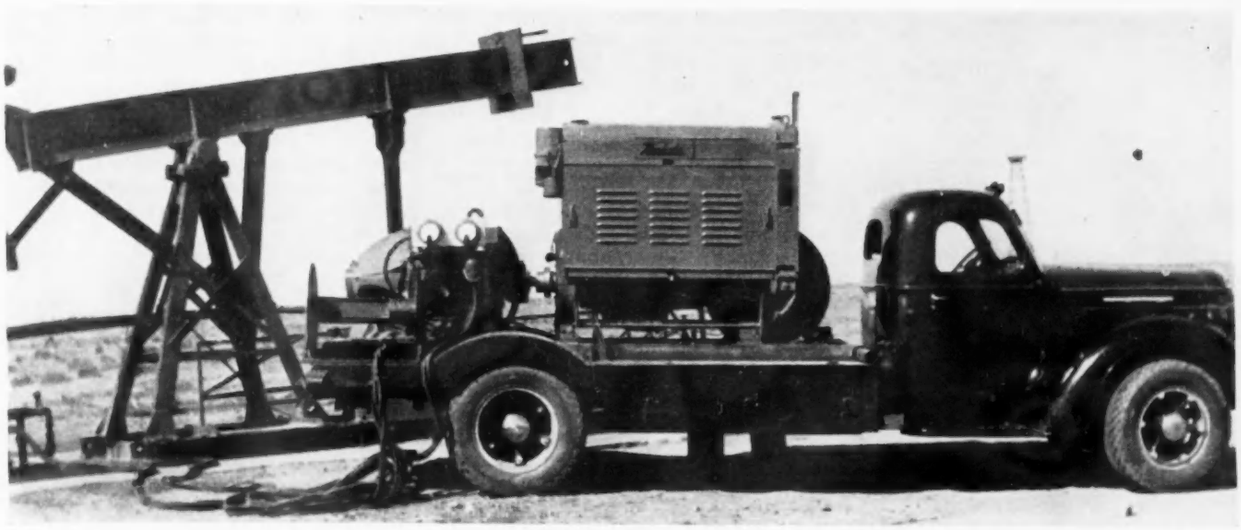
Aside from the influence on the industry's volumes of domestic and export business, the war developments will have various other direct and indirect effects. For example, it is indicated that the industry will be called upon within a few weeks to begin collecting from the motoring public 1½ cents a gallon federal tax on gasoline, instead of 1 cent as heretofore, to apply on the cost of the contemplated national defense program. Oil companies also will be required to pay larger corporate income taxes. And their customers, the motoring public, will be obliged to pay higher individual income taxes. The heavier taxes on gasoline will tend to retard consumption of that product. The larger corporate taxes will turn an increased portion of oil company earnings into governmental use. And the boosting of taxes on individuals will affect consumer buying power and indirectly the consumption of oils. The oil industry, therefore, necessarily must feel to some extent the burden that will be entailed in raising funds for the stronger national defense; although the industry will share in any increase of business generated by the program.

Active naval operations from Norway to the Mediterranean indicate that the intensified war requires much fuel oil as well as other petroleum products.

Whether or not the industry will come under some sort of federal government regulation in consequence of the war developments remains to be seen. Spokesmen for the industry assert that it is in better position than any other industry for meeting any emergency demands that might be made upon it because of war or the threat of war. They point out that the United States now has in reserve, underground, more oil than ever before, in consequence of the diligence and effective operation of the industry, and that refining and pipe-line facilities, similarly, are quite adequate for meeting any reasonable demands. Nevertheless, a survey of the industry's facilities, to determine their adequacy or inadequacy, has been ordered by the administration, and it is possible that the industry may be asked to provide additional facilities, such as new or enlarged crude oil or gasoline pipe lines to strategic points.

Under the recently announced plans for national defense, the petroleum industry will be under the member of the advisory commission on defense in charge of procurement of raw materials, who will be responsible for coordinating the oil industry's efforts in such manner as to insure the furnishing of the industry's products in needed quantities to the military and to enterprises collaborating in the defense program.

On their own initiative, meanwhile, many oil companies plan immediate expansion of their refining facilities for making aviation gasoline, as developments have foreshadowed great expansion of demand for that product. The possibility of an extraordinary increase in aviation gasoline consumption is indicated when it is considered that a great spreading out of civil aviation may be necessary in conjunction with the strengthening of military aviation, in providing opportunities for peacetime occupations as a background for the men who temporarily enter military service. Although aviation gasoline at present constitutes only about 2 percent of all motor fuel in use, the oil industry henceforth will be called upon for larger and larger capacities for turning out high-octane gasoline for airplane motors.



Paraffin Removed Economically by Electrical Process

By BRAD MILLS, Associate Editor

A NEW method for removing paraffin deposits, by heating the tubing electrically, has been used with sufficient success in the Texas Panhandle by Drilling & Exploration Company to warrant installation of permanent units on 30 pumping wells over a two-year period.

The company has kept a production record of each of the 30 wells electrically equipped for paraffin treatment. Total oil production from this group has been about 115,000 barrels, and the calculated cost for paraffin treatment has been $787.50. In arriving at treating costs, only the tangible items were considered. This overall cost is considered lower than the preceding average paraffin-treating expense for the Panhandle area. One operator who produced 360,000 barrels of oil during 1938 reported his cost of operations due to paraffin was 1.6 cents per barrel.

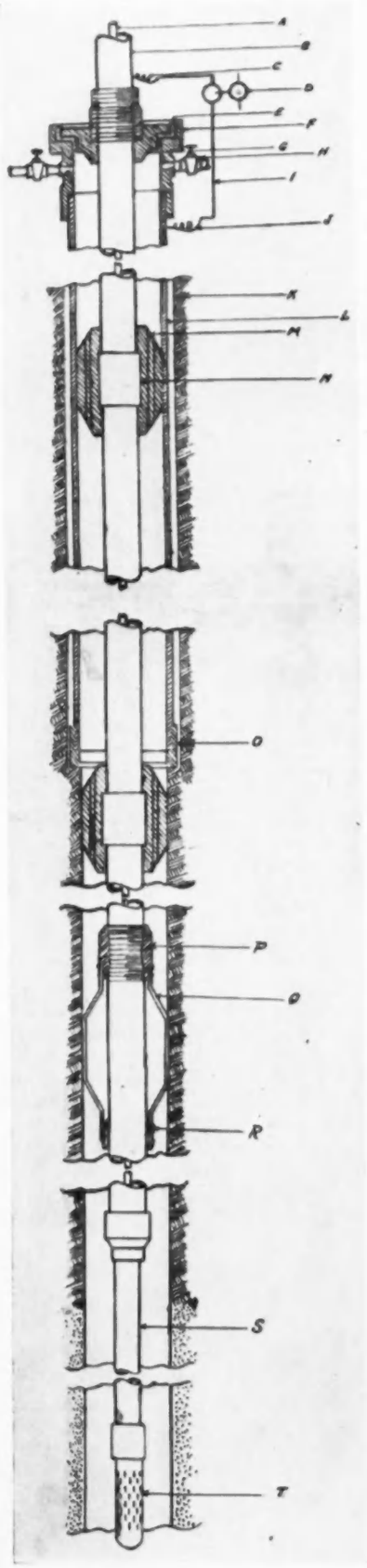
Wells equipped have not been pulled for the express purpose of making the installations, but were pumped until mechanical failures or paraffin trouble necessitated pulling jobs. The practice is a sharp departure from the usual methods employed for removing paraffin deposits in the Panhandle area.

Certain special well equipment obviously is necessary to heat the tubing electrically. The tubing hanger is insulated from the casinghead by an insulating medium shaped to fit the heads, while the tubing is insulated from the casing by conical-shaped insulators placed around the couplings to hold the tubing in spaced relation to the casing. A spring contact is set at the required depth to complete the circuit between the tubing and casing. A direct or alternating current of high amperage and comparatively low voltage is then introduced by connecting the input terminal to the tubing and the return terminal to the casing. This removes the necessity for using cables between the tubing and casing, since the current passes down through the tubing, through the contact springs, and back through the casing or formation. Heat is generated in the tubing, rather than in the casing, because of the smaller diameter of the tubing and its consequent greater resistance to the current.

The generator (top) is built to deliver high amperage and low voltage. Tubing is heated only to a temperature that melts paraffin with no danger of crystalization of the pipe. Heat is applied in ordinary treatments for about one hour.

A neoprene insulator is used between the tubing hanger and casinghead. The seat is ¾-inch thick and is fiber inserted to provide added strength for supporting the weight of the tubing. A neoprene skirt ⅛-inch thick extends 1½ inches upward from the seat to prevent any contact between the upper lips of the tubing hanger and casinghead, and a skirt of the same thickness extends 2½ inches downward from the seat to prevent shorting the current between the tubing or tubing head and casing.

The tubing insulators are turned from hardwood and bored through the center to fit the various tubing sizes. They are then counterbored with a recess that forms a firmly fitting shoulder around and against the ends of the tubing coupling. This prevents upward or downward slippage. The ends are tapered to avoid hanging up and breakage as the insulators pass



Sketch of a complete well installation is shown: A, sucker rods; B, ordinary well tubing; C, terminal attached to tubing; D, source of electric current; E, insulator between tubing hanger and casing head; F, Berry pattern casing-head; G, tubing hanger; H, well head connection; I, cables from source of current supply; J, terminal attached to casing; K, formation of well bore; L, well casing; M, tubing insulator; N, tubing coupling; O, casing shoe; P, special coupling; Q, contact spring; R, sliding sleeve; S, working barrel; T, perforated nipple.

through the casing. They are then sawed lengthwise through the center in a curved or wavy manner, the curved surfaces fitting closely together when the two halves are put on the tubing coupling. When either half catches or hangs up for any reason, the opposite half tends to take part of the stress on the curved bearing surface.

Cone-shaped galvanized metal sleeves are fitted around the tapered ends of the wood insulators. These sleeves hold the insulators in place and protect the tapered ends against cutting. Wood screws are used for holding the sleeves in place. After the insulators are turned and bored, they are impregnated with linseed oil to prevent absorption of moisture that might lead to shorting or leakage of current.

For installations on 2⅜-inch O.D. tubing in 7-inch O.D. casing, insulators are 5½ inches O.D. and 10¾ inches long. The bearing surface on the full diameter is 5 inches long and the ends are tapered to 3 inches O.D., allowing a 2½-inch taper. For other casing sizes the outside diameter is varied accordingly. For 5½-inch O.D. casing the insulators are 4⅝ inches O.D., with a 5-inch bearing surface and a taper to 3 inches O.D. In no case do the insulators fill the casing, the diameter always being small enough to permit gas to pass around.

The contact consists of 4 leaf springs that are welded to a specially made threaded coupling at the top and to a sliding sleeve at the bottom. This provides flexibility and avoids breakage when lowering the spring through the casing. The contact may be set at any point in the casing, or may be set in the formation below the casing. In the latter case the formation serves as the return circuit for the current. An installation is made by removing one of the couplings and screwing the tubing into the coupling at the top of the contact. The springs may be shaped to exert any required amount of outward pressure on the casing, while the contact and cross-sectional areas may be varied to suit tubing and casing sizes. A contact set on 2⅜-inch O.D. upset tubing in 7-inch casing uses spring steel ¼-inch thick and 2½ inches wide, giving a cross-sectional area of about 2.50 square inches for the four springs as compared with 1.28 square inches in the tubing joint. This gives nearly twice as much metal for conducting the current through the springs as through the tubing joint. The contact area against the casing is about 160 square inches, but this area may be regulated by changing the length and width of the springs. Use of a generous cross-sectional area in the spring and a liberal contact area under required pressure gives the same effect as that of an ordinary knife switch. Temperature tests have shown that the heating effect is less at the points of contact than at any point within the tubing itself.

Well-head terminal connections. Current passes down the tubing and up casing.

The current for heating is supplied by a variably controlled D.C. generating unit. The generator is specially constructed to deliver a current of high amperage and low voltage. It is driven by a 150-horsepower gasoline engine with

shafts connected direct. The two are mounted on a truck as a unit.

In making the installations, the tubing threads are cleaned carefully and a light grade of oil containing some graphite is applied. The joints are made up tight, the engaged threads of the tubing and coupling giving a greater contact surface than the same length of space in the tubing joint. Thus the threads do not constitute points of high resistance, but act more as a knife switch. The coupled joints actually offer less resistance to the flow of current than the tubing proper, and heat developed is proportionately lower. The resistance is somewhat greater in older tubing strings, because of corrosion in the threads, but actual temperature tests have shown that the coupled joints and threads of tubing that had been in use for several years was about 10 percent cooler than the tubing itself. Current as high as 775 amperes at 91 volts, or about 70.5 KW, has been applied to the tubing in the 30 equipped wells, and in no case has overheating been reported.

Low Heat Required

Temperatures required to remove the paraffin are relatively low, the highest yet found necessary having been 109° F. in a well that had been pumped until the rods stuck. Paraffin deposits formed in the tubing usually are soft, but they do not become plastic until heated to a temperature high enough to drive out the oil and gas associated with them. When treating by the electrical method, the tubing is heated and the paraffin film in direct contact with the inside of the tubing is melted first. Only enough heat is generated to cause the deposits to slip from the tubing. The heat requirement is determined for each well. In several wells the heat applied has been as low as 90° F. This low heat requirement does not make crystallization of the metal in the tubing a matter of concern. The tests described apply only to wells equipped in the Texas Panhandle, and conditions will vary in other fields. It is believed that it will be necessary to raise the temperature of the tubing only to that of bottom-hole temperature, in the treatment of any well.

Tubing insulators are turned from hard wood bored to fit various tubing sizes.

No electrolytic action between the tubing and casing has been indicated and none is believed possible where contacts are made properly. The metal used in the construction of the contact springs is similar to that used in the casing and tubing. Oil offers no electrolytic problem, and only when mixed with a 12 percent, or greater, solution of salt water outside the tubing and between the tubing and casing would electrolysis occur, it is believed. Any amount of salt water inside the tubing probably would have no effect, since the tubing is a part of the continuous circuit. When direct current is used, any tendency toward electrolytic action or magnetic effect created in one direction may be stopped by reversing the polarity any number of times during the treatment, the operator states.

Drilling and Exploration Company installed electrical equipment in a well, with the contact set on the sixty-fourth joint of 2-inch upset tubing. Wood insulators were placed on each tubing coupling and the tubing head was insulated with rubber. The rods stuck in paraffin after the well had been pumped 93 days. A D.C. generator capable of delivering 1000 amperes was connected, and a current of 675 amperes at 88 volts applied for 1 hour. The temperature at the well head was raised from 32° F. to 90° F. Immediately after the cables were disconnected, the pumping unit was started, with the rods dropping freely. About 6 barrels of paraffin were pumped into the pit. The first was soft but thick enough to pile up under the flow pipe; the remainder a viscous liquid. After the paraffin was pumped out, the rods dropped freely. The company has found it unnecessary to pump the paraffin out immediately after treatment, since the paraffin has shown a tendency to remain in solution for some time. This well has been on production 78 days since treatment and has shown no paraffin trouble, the company said.

Spring contacts carry current from tubing to casing below the paraffin belt.

Success Under Varying Conditions

A second well in the area, not electrically equipped, was pumped until the rods stuck. The rods and tubing were pulled, and the tubing run back without cleaning. Electrical equipment was installed with the contact set on the sixtieth joint down. The top 45 joints of tubing were plugged with paraffin. A current of 775 amperes at 79 volts was applied to the tubing. The rods were later run with an insert pump on bottom, and the pump seated without difficulty. The paraffin was pumped from the tubing in a short time.

The electrical treatment has been applied successfully to pumping wells under a variety of conditions. In one well where the rods had parted at the twelfth joint from top, the paraffin was softened enough to permit running a fishing socket for recovering the rods. In another well a pulling job was necessary because of worn cups. Paraffin had accumulated in the tubing and only seven rods could be pulled. After application of the electrical treatment all rods were pulled, and an insert pump installed.

Drilling and Exploration Company's experience indicates that removal of paraffin deposits by heating the tubing electrically is a practice beyond experimental stage.

To Try Pressure Maintenance On Small, Shallow Tract

By FRANK B. TAYLOR, Staff Writer

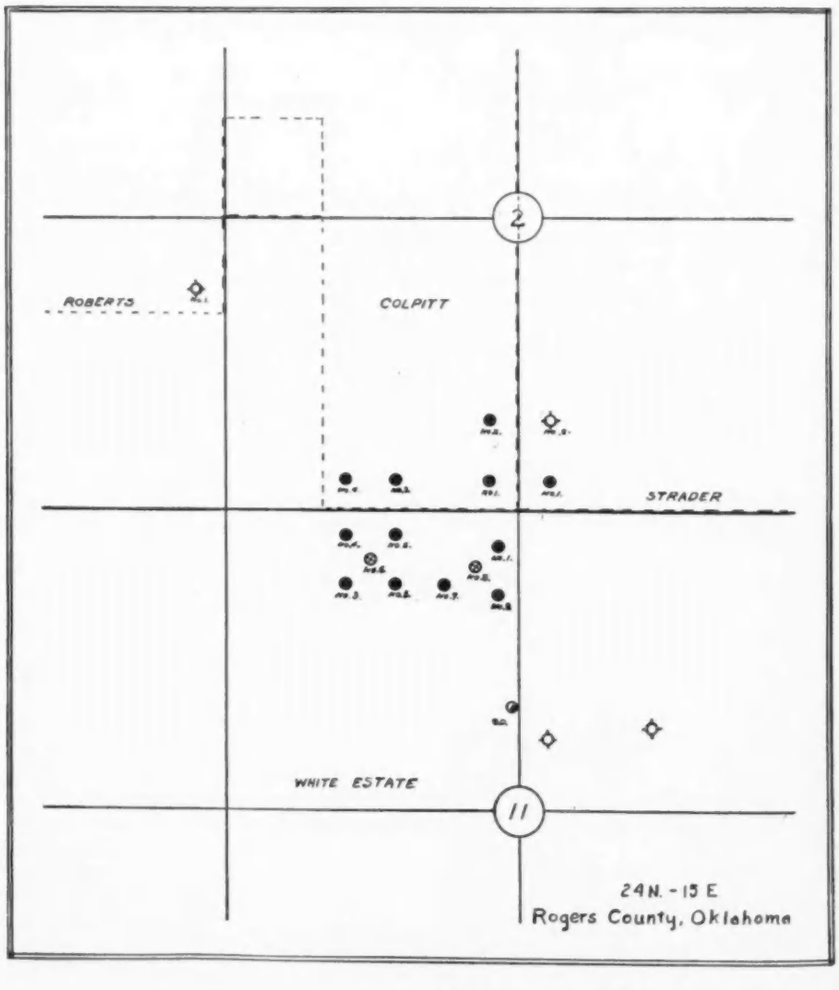
OF THE more than 200 pressure-injection operations in the upper Mid-Continent area, only a small number are pressure-maintenance projects, by far the majority being some type of repressuring work. Of the few maintenance operations, that of Oklahoma Oil Corporation near Nowata is the most recent to get underway. In a number of respects the project departs from the ordinary, and therefore will be watched with interest by operators in other areas. Foremost in interest is the apparent small quantity of productive acreage involved. Moreover the project is is not expected to increase profit until a more advanced stage of operation is reached. At this time it is only in the initiative stage, and only the primary elements toward getting the work underway can be analyzed, but here again are some points of interest.

It is usual to deplete the formation to whatever extent is economically possible by routine pumping, then to resort to some means of secondary recovery. However, regardless of what recovery means might eventually be employed, it is desirable to exhaust a minimum of reservoir pressure and that as slowly as possible. It is desirable from the engineering viewpoint to sustain reservoir pressure at or near the original to assure as high an ultimate recovery as possible. This necessitates return of pressure immediately production is begun.

From the economic standpoint, it is apparent that a continual, normal process of pressure maintenance is less costly than exhaustion and subsequent rebuilding of reservoir pressure. In considering the same question from the point of maximum recovery, there is an added reason for sustaining the original bottom-hole pressure at or near its original figure. If there is anywhere near a normal pressure on a formation when it is first tapped, then any gas present in solution in the oil represents important energy.

When this gas is allowed to become exhausted, the oil becomes relatively inactive as it no longer has internal energy. When repressured by any means some of the gas freed from the oil returns into solution, as evidenced by the decreased viscosity after flood operations are well underway, but never enough to equal the original internal energy of the crude. As a result, maximum recovery is possible through sustaining reservoir pressure to exhaustion of the crude rather than by repressuring after original pressures have allowed dissolved gas to come out of solution.

Faced with these facts early in the development of a shallow tract, Oklahoma Oil Corporation decided to maintain pressure of the forma-



Map of Oklahoma Oil Corporation's lease near Nowata, Oklahoma, where a pressure maintenance program is being tried on a small scale. *X* circles show input wells.

Input well hook up. Pressure built up to 400 pounds before formation took the gas.

tion by injection of natural gas with George Noble in charge of the operation.

The History in Brief

As a direct result of redevelopment in the northeast Oklahoma-southeast Kansas shallow trend a number of new pools have been opened. The production described falls into this category. Referring to the map it is seen that of three tests drilled near the center of Section 11, the one to the west showed for some oil but not sufficient for a commercial producer at the price prevalent when the test was drilled, in the early twenties.

On the strength of this showing, White Estate 1, NE NEc 11-24n-15e, Rogers County, was drilled to Bartlesville and completed for considerable gas and 18 barrels. A diagonal offset, Strader 1, found only a thin section of the sand and although shot with 80 quarts failed to show more than 1/3 barrel. The next well drilled was Colpitt 1, north offset to the original, and this test flowed 80 barrels to give final proof to the area. The next try, Colpitt 2, made 5 barrels from Bartlesville although hole was bottomed in lime at 1074 to 1120 feet. White Estate 1 was completed in July 1938 and Colpitt 2 in January 1939. Following this well title of the property was acquired by Oklahoma Oil Corporation through purchase from C. E. Reynolds.

The new owner continued development of the acreage with a cable tool unit, and has completed 12 producers; two failures, one on the Roberts and the other on the Strader, and two injection wells for repressuring. From an analysis of this drilling program in terms of initial production of individual completions it would appear the trend of production is toward the southwest of first drilling, and that possibly twice as many producers might ultimately be drilled. Productive limits cannot be definitely established until additional wells are drilled in this direction.

Well and Formation Data

Well & No.	Completed	Sand Feet	Shot Qts.	Initial Bbls.
White Est. 1	7/11/38	794-819	40	18
Strader 1	8/11/38	797-817	80	0½
Colpitt 1	8/31/38	790-816	80	80
Colpitt 2	1/16/39	816-834	60	5
White Est. 2	4/14/39	796-824	90	125
Colpitt 3	5/16/39	806-828	80	100
Roberts 1	6/27/39	td-1381	..	dry
Strader 2	7/ 3 /39	804-811	..	dry
White Est. 4	7/25/39	804-831	80	40
Colpitt 4	8/15/39	806-828	100	10
White Est. 3	9/16/39	808-828	60	30
White Est. 5	10/2/39	799-823	60	40
White Est. 6	10/14/39	804-828	..	**
White Est. 7	10/26/39	798-819	80	50
White Est. 8	3/29/40	796-820	..	**

White Est. 9 (In Process of Completion.)
**Injection.

An abbreviated drillers log on White Estate 2 shows the following as characteristic of the field:

0—5	feet yellow shale
65	blue shale
75	lime
132	black shale
349	white slate
434	sandy lime (4 bailers water)
590	white lime (field marker, rather uniform at 2 feet)
796	sandy shale—first show
801	sand—increased oil
807	sand—increased oil
824	out of sand, shale
830	dark shale (Characteristic of Bartlesville)
840	light shale and TD.

From a study of this and other logs of wells, it was found that the better sand section of the producers averaged 20 feet in thickness. However, a number of wells had a sandy shale section immediately above the Bartlesville which also showed for production. Just below the Bartlesville a thin section of dark, sandy shale was drilled, a characteristic of Bartlesville formation throughout the area which in many sectors contains a heavy, black, viscous crude.

Maintenance of Reservoir Energy

Aware of the desirability of early pressure injection, the company arranged to have cores taken and commercially analyzed as a basis for probable injection. At a later date a laboratory for core analysis was built on the lease.

Cored data indicated characteristic Bartlesville sand with per-acre reserve dependent upon thickness of the sand section. Minimum permeability was found to be 7.5, high was 46 and average was judged to be about 35 millidarcys. Porosity was checked at 18 to 20 percent. Bottom-hole pressure was found to be about 328 pounds. Gravity of the crude was determined as being somewhat higher than normal, testing 42 degrees at the well, a premium crude.

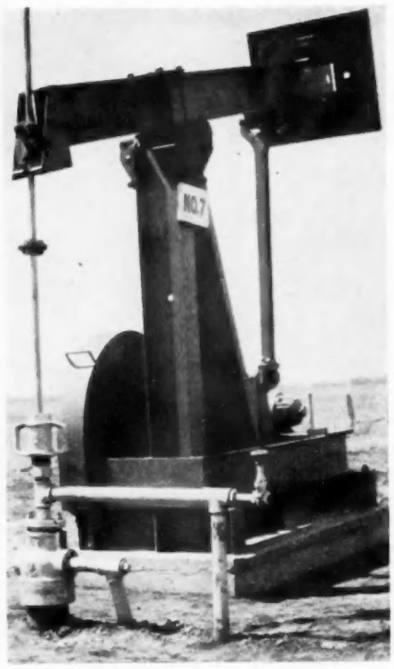
Apparently the 30 years of development of the region has not lowered the formation pressure of this specific area through drainage. This, and surrounding failures, point toward the spot as being an isolated unit of accumulation. This assures localization and confinement of any pressure-maintenance program, an important and in this instance a favorable factor. With these facts but without the field being definitely delimited it was necessary to decide upon pressure maintenance and manner of application if deemed desirable.

It is ordinary practice to judge the possible worth of a pressure-maintenance program on the expected increase in recoverable reserve, but in this case a reserve estimate could not be set up. Therefore, the following was assumed as determinates. Disregarding entirely the possible ultimate recovery by ordinary pumping means, a figure that would necessarily be presumptive in view of the short life of the field to the present time, a prospective was established of ultimate normal, shallow recoveries with and without pressure maintenance. Ultimates were adjusted on this basis with average initial and decline projections the known factors. Practice in the general Northeast Oklahoma trend has indicated the curve used exemplifies

normal depletion rates with and without stimulation.

From the known factors, the most important being initial production which averaged 50 barrels per well, plotted against an expectancy curve, it was determined that pressure maintenance would be profitable, and particularly so if it could be executed without large investment. On the economic side, gas for injection was considered the greatest item of expense. As the wells showed more than ordinary volumes of gas, and also as the company holds rights and has one 60,000-foot gas well on property a mile north of the crude production, the outlay for natural gas was discounted. Some equipment was on hand for a small repressuring plant, and only two injection wells would be necessary to put the program into operation.

White Estate 6 and 8 were drilled, cased and tubed but not shot. Injection lines were laid and a compressor unit installed. The choice of this unit was made not through an estimation of pressure and capacity requirements, but rather because it was already in stock. While necessity for economy dictated selection of much equipment, no effort has been wasted to guarantee efficient operation. The compressor is a two-stage with a low side 10 x 10-inch and a high side 4½ x 10-inch, belt driven from a two-cylinder, two-cycle, 100-horsepower gas fueled power end. Input to the compressor is about 32 pounds, this being an 8-pound drop from the back pressure of 40 pounds held against the producers. A scrubber cleans the gas into the plant and the volume is measured through an orifice meter. Engine jacket water and compressor cooling water is cooled in two radiators through which air is forced by fans.

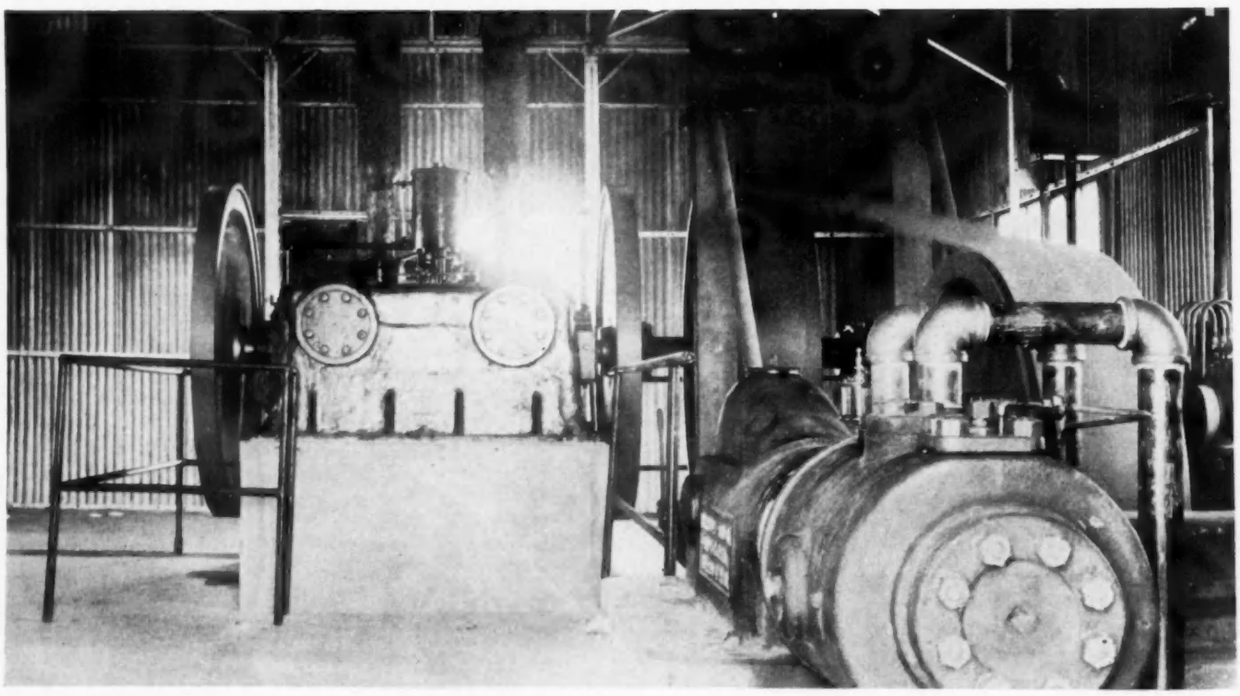


Pumping well, showing well head, unit foundation and all-weather protection.

With one exception, producing wells are pumped with electric units governed by clock-operated intermitters. Production has averaged 3,063 barrels per month for the three leases during the past 9 months, and it appears that the production has reached a more or less constant rate. It is too early to judge any immediate effect of the repressuring toward stimulation of the production rate. Of the total volume produced, only about 16 barrels per day is water.

All producers are equipped with 7-inch, 17-pound casing cemented on top of the sand, and all are being pumped, although initial production was made by flow. On input wells, a common manifold is used with flange connection for an orifice meter. Spacing is 330 feet between producers, the input wells being drilled in the center of a four-spot.

While only the initial stages of the operation are now underway, the conditions closely parallel those found in many of the producing areas of the shallow sector. The decision to maintain reservoir pressure in order to increase the ultimate recovery appears to be well-founded. Future development and response to injection are the factors that will determine the economic value of the operation.



The compressor is powered by 100 h.p. gas engine. Electric pumps are used.

Waste in Oil Reservoirs

By S. F. SHAW, Consulting Engineer

IT IS difficult to give an acceptable definition of oil-field waste since any definition offered probably would not be satisfactory to others who have studied the question. There are losses of oil, or waste, if it be called that, which are unavoidable; oil remains currently unrecovered in the reservoir that will be recovered at some later time. There also have been absolute wastes such as oil running down creeks and not recovered; oil burned in wells that catch fire; oil left in the reservoir under conditions that likely will never permit it to be recovered in this age of the world.

Some 15 to 20 years ago, we were told that the recovery of oil from the average reservoir was on the order of 10 to 25 percent of the total volume, perhaps averaging 15 percent. That was the best estimate, or guess, that engineers and geologists could make at the time since they did not know as much as they know today about conditions in oil reservoirs. These low percentages were applied for the most part to sand reservoirs that today are considered very shallow where the reservoir pressures are of low order, as is the case in nearly all shallow reservoirs. In such fields, comparatively low recoveries are yet obtained with primary methods of extraction.

Although lower primary-recovery percentages do apply to shallow reservoirs than do deeper horizons, a better understanding of the reservoir conditions indicates that low estimates of recovery percentages made in early years were incorrect, whether the estimates were made on shallow or on deeper fields, inasmuch as appreciable deductions were made by pipe-line companies to offset losses in transportation, which were not a loss so far as the reservoir recovery was concerned, but which was seldom accounted for in making estimates on recovery. Considerable oil was consumed on the lease as fuel, whereas gas accompanying the oil now is used largely for this purpose. Oil used as fuel was recovered from the reservoir but was not included in the recovery estimates. Considerable oil was burned as waste because little was known about treatment methods which would have recovered much of it. For the past 10 or 15 years, serious efforts have been made to reduce waste because by burning waste oil, and today there is a very low loss due to this cause. Here again oil was recovered from the reservoir that did not receive credit in early recovery estimates because there was no way of determining the quantity of oil that was lost in this manner. Allowance was not made for the space occupied by the gas in the reservoir because the gas was not measured as it was produced, nor did the engineer know to what extent the gas occupied space in the reservoir when dissolved by the oil, nor how much space it occupied as a gas cap. Allowance was not made for connate water contained in the pore space [1], and it is not clear even to this day as to the percentage of space so occupied. Some guesses on percentage of connate water are being made in certain fields, but these must be made subject to a better understanding of the space so occupied. Actual thickness of the reservoir rock could not be as readily and as nearly accurately determined as at present, since cores were not taken to any extent; porosity percentages were much less perfectly known. Under these circumstances, it is not surprising that recovery percentages estimated in early years were considerably lower than would be computed now. We cannot say how much early estimates were in error, but they probably should have ranged from perhaps 50 percent to possibly 200 percent greater than was estimated.

Comparisons, therefore, of recovery percentages made in early years with those estimated at present have little meaning and cannot be employed for indicating to what extent methods now employed have been improved over those used many years ago. Much is said about the large increase in recovery to be obtained by pressure maintenance over earlier methods, yet when we consider that no pressure-maintenance project on any considerable scale has ever yet reached the point where it can be stated with any close degree of approximation what the ultimate recovery will be, it seems to be stretching a point to make comparisons of a method where the recovery is as yet far from being known, with fields where the recovery percentage was probably considerably underrated. It is, however, in the line of progress to make every reasonable effort to increase the accuracy of estimates of past and present recoveries, and where it can be done profitably to try out various methods that seem to have any prospect of success in increasing the recovery.

Increased Recovery by Secondary Methods

Does waste occur when oil is allowed to remain in the reservoir because it is unprofitable at a given time to extract it? In the sense of not being recovered at the present time it might be termed waste, but if it is left in the reservoir in such condition that less expensive methods, or higher prices for oil, make it possible to recover the oil later, it does not seem proper to consider it as waste. This is particularly true of the shallow fields to which reference has been made already, where the cost of resuming operation in the reservoir is not prohibitive.

Secondary extraction methods have increased the ultimate recovery in certain fields by a considerable percentage. Air and gas drive, or the so-called repressuring methods, have been employed to advantage in many fields, and waterflooding methods also have been of considerable benefit in certain areas for increasing ultimate recovery.

Secondary recovery methods in shallow sands have been advancing in accomplishment, particularly within the past 20 years, and will account for increase in recoveries in some of the areas on which lower estimates were made previously, in consequence of which early esti-

mates will have to be revised upward, thus changing the figures formerly used. The delay in recovery for years, or even for decades, from such fields does not constitute reservoir waste in those earlier years, but merely a delay in extracting the oil.

Sometimes these secondary recovery methods are shown to be unprofitable due, perhaps, in most cases to the fact that the price received for the oil was lower than was anticipated. Such a case appears to exist in the Bradford field, Pennsylvania, where extensive water-flooding projects have been underway for several years, and yet due to the comparatively low price received for the oil, the financial outcome is in doubt in some cases.[2, 3]

Not all gas-drive projects have been financial successes. It is true that larger ultimate recovery is obtained in nearly all gas-drive operations, but if it were to become generally established that such projects were to result in a loss, there would be few attempts made to increase the ultimate recovery just for the sake of the accomplishment, consequently higher ultimate recovery is not the only criterion that controls the action of the operator.

Wastes That Occurred in Early Days

There was a time when lack of interest, lack of technical knowledge, lack of funds, etc., resulted in oil overflowing from tanks; in escape from leaky pipe lines; evaporation of vapors from stock tanks; burning of oil unacceptable to the pipeline companies; blowing out of wells and consequent escape of oil and gas in immense quantities; improper handling of wells, etc., but this condition is to a large degree a matter of the past. Very seldom does one now see pipe-line oil floating down streams as has been noted in the distant past, and for 10 or 15 years this kind of waste practically has been eliminated.

Was There Waste at Seminole?

In the very early days of the Seminole field, there were insufficient gasoline plants to handle the gas being produced from the wells, and some of the gas escaped into the air, but this condition was remedied rapidly, and large recoveries of gasoline were produced in these plants, at one time approaching the neighborhood of 1,000,000 gallons per day.

Gas-oil ratios were of low order at Seminole, and the total qauntity of dry residue gas from the gasoline plants was soon required for purposes of drilling, for gas-lift plants, pumping engines, heating purposes, and very little went to the air to be wasted.

There was a rush at Seminole to drill wells and extract the oil rapidly at a time when the cost of material was high, and costs of drilling and extraction were higher than would otherwise have been the case, but this aided in obtaining higher recovery, as the writer views the matter, rather than in waste as a result of oil being left underground. In fact, it was first in this field that recoveries of 50 to 75 percent appeared quite possible to be reached. This intensive race to get the oil did result in reducing the price of oil, but Seminole alone was not responsible for this condition, since the Hendrick field in West Texas, reached a peak of 300,000 barrels per day at this time, and other fields in West Texas were rapidly increasing in production during the same period. Spindletop, on the Gulf Coast, had just been resurrected by deeper drilling down the flanks; California was making strides in increasing production, all of which contributed toward causing the produced supply to become much greater than the demand, and no other results could be expected than a general reduction in the price of oil.

To charge this large production to wasteful extraction methods, or to the operators in any one field, shows a lack of understanding, as I see it, of the situation on the part of those who take this position. This oil produced in excess of the demand was not wasted in large degree, certainly not wasted so far as the reservoir was concerned: it was stored on the surface to be held until it could be used. But the result was a decline in price, and when the available storage was exhausted, nothing else could happen than a curtailment of this production.

Little Avoidable Waste

The writer has spent the entire time since 1926 actually in the oil fields in various parts of the United States, South America, and Europe, and did not see any appreciable evidence of avoidable waste, despite the descrpitions that have been given out to the press to that effect. At the time that the large production was being extracted in various fields and stored in 1927 to 1930, it would not be foreseen that other large fields would be discovered such as East Texas, Kettleman Hills, Conroe, Hastings, and Illinois, which would make for a long delay in running from storage the oil that had accumulated, nor could it be known that a major depression would take place, consequently it was only natural that oil would be stored under such circumstances in order to assure refineries of a future supply. If there should be a lull in oil discoveries in the near future, lasting over a period of a few years, with price of oil rising to $2.00 or $3.00 per barrel, it is my belief that the same sort of procedure would take place that occurred in 1926 to 1930 when drilling in newly discovered fields would proceed at a rapid pace, and production methods would strive for the maximum daily output, differing only in the use of improved technique that has been developed during the past 15 years. Probably gasoline plants would be built quickly to take care of the extraction of gasoline, and gas would not be blown into the air, but other features of production in extracting the maximum daily rate of oil probably would proceed much as they did in these earlier years.

Certainly there were wild wells, with enormous quantities of gas accompanied in some cases by oil going to waste, but the owners of such wells were more anxious than any one else to control them, and lives were lost in attempts to gain control. There will be more of such wild wells, due to unexpectedly high pressures, to carelessness, to failure of equipment, but these conditions are being improved gradually as a better knowledge of such conditions is acquired by the oilfield operators and their technical assistants. By reason of its very nature, the laboratory of oil field operations must be the field itself and investigations must be carried on in the field and on a field operating scale to arrive at proper conclusions.

In the opinion of the writers, increase in ultimate recovery brought about by natural water drive, by restriction of production, by attempts to change gas-oil ratios without regard to the conditions in the reservoir, is of doubtful benefit. If there is an active water drive, the recovery will be high whatever be the rate within reason at which the field is produced. Examples that may be cited of strong water drive are Hendrick, Corpus Christi, Luling, Salt Flat and similar fields. When the percentage of oil in the

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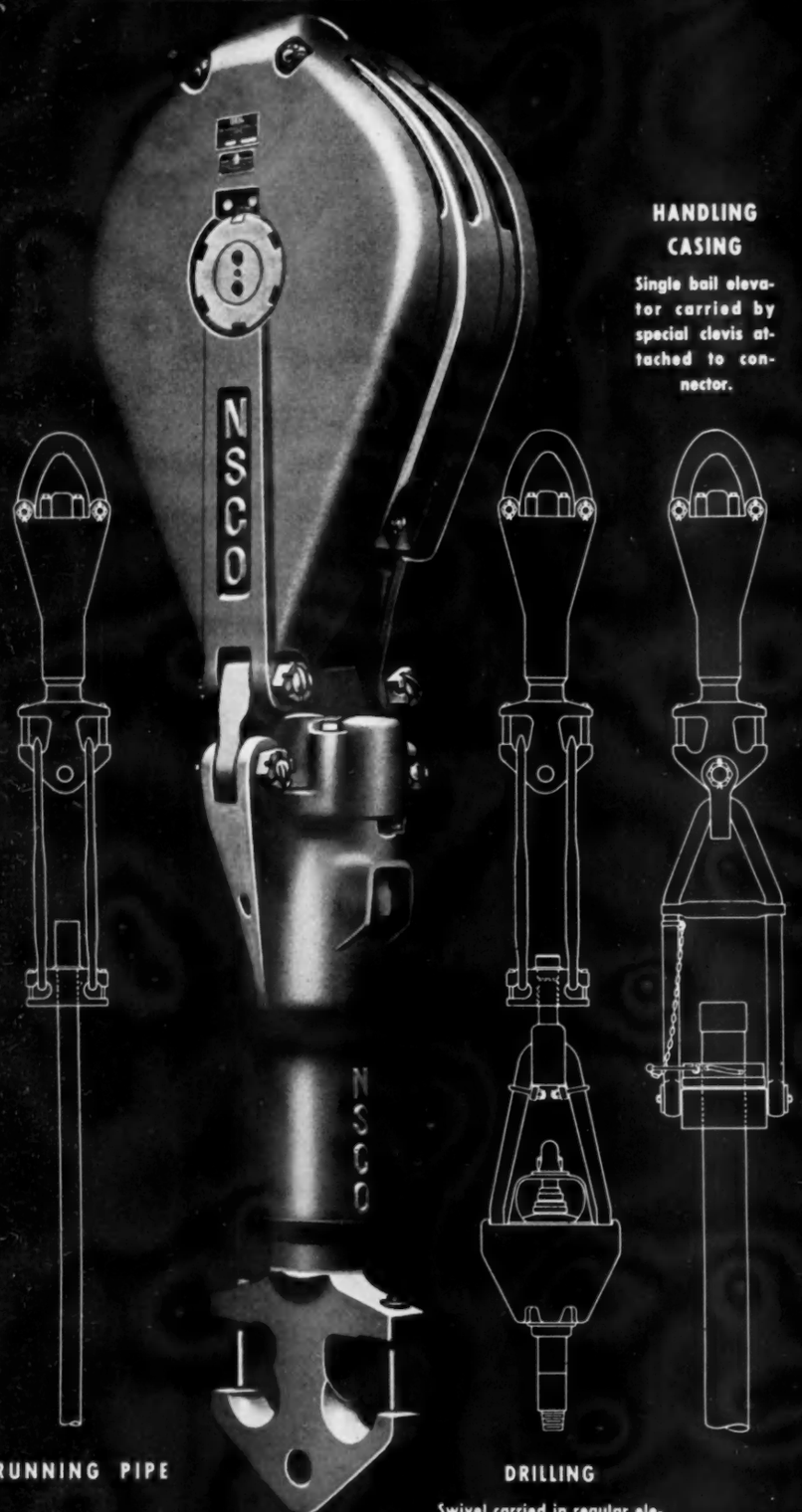

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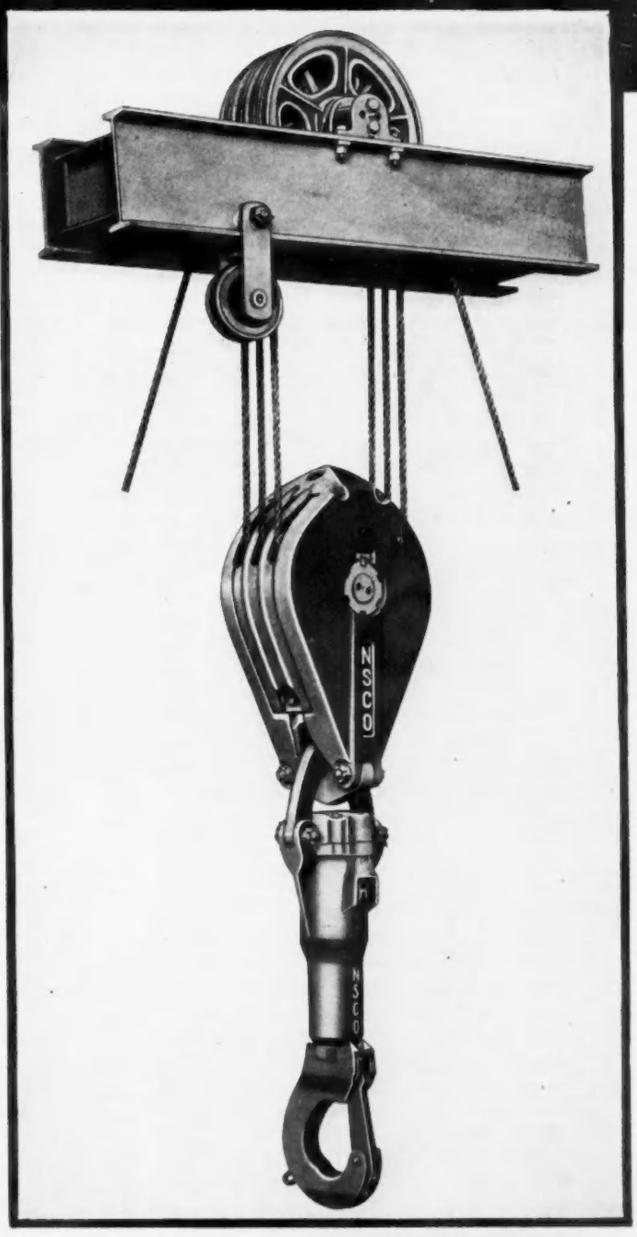

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BRIEF SPECIFICATIONS

Capacity, tons	60
Maximum size elevator links accommodated, inches	2¾
Number of locking positions	8
Clevis section at block clevis contact, inches	2x5
Spring travel, inches	7
Shank diameter, inches	3¾
Width over-all (across yoke member), inches	18¾
Height over-all, inches	72
Net weight, pounds	1070

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fluid declines to ½ to 2 percent, as now prevails at the two first mentioned fields, it indicates that the recovery has been very high.

There are fields in which there is no active water drive; where the sand- or lime-producing formation is tight; and where recovery is dependent solely upon the gas associated with the oil; and upon the force of gravity in such fields, high gas-oil ratios may result in lower ultimate recovery than if the production be made at the rate that will reduce the gas-oil ratios only to such a point that profits are not seriously jeopardized, although we have no definite proof that such would be the case. But if production must be curtailed to the point where there is a financial loss in the operation, then the oil should, and probably will be, allowed to remain in the ground until better recovery methods or better prices permit profit. The oil is not lost, or wasted, but it must await the development of better extraction methods, or a better price. In fact, the price received for the oil is largely the dominant factor under any condition and this applies to any percentage of ultimate recovery that is usually obtained.

There are fields where there may or may not be an active water drive, where the formation is very porous and very permeable, and where the production of wells at maximum capacity does not increase the gas-oil ratios materially, such as the Wilcox sand pools of Tonkawa, Wewoka, Seminole, and Oklahoma City. In this type of reservoir, I believe that ultimate recovery is probably higher if produced at maximum capacity, inasmuch as high-capacity methods can be employed to advantage under such conditions. Such methods are very profitable, and it is likely that the operators will adopt these high-capacity methods again under similar conditions provided there is a large demand for the oil and also provided that production at high capacity does not interfere with the price structure. In the event that the pool is large, and the market cannot absorb the oil without displacing other oil from the market, thereby causing a serious reduction in price, it would be most unwise to attempt to produce the oil at maximum capacity even though the ultimate recovery be reduced to a lower figure by producing at a lower rate.

When gas is dissolved in oil, it has been observed that the viscosity of the fluid is reduced [4] and surmise has been made that after the gas has largely escaped from the oil, it becomes viscous and travels with difficulty toward the well. This may or may not happen in fields where the oil exists in the reservoir as a very heavy oil, particularly in shallow reservoirs where pressure and temperature are low, but in deep reservoirs where the temperatures are comparatively high, and where the oil is usually of fairly high gravity, it is questionable whether the loss of gas from the oil increases the viscosity to any large extent, at least to the extent where it seriously impedes the flow through the formation. In the Seminole field, where the gas became reduced to a low point, the produced oil was not reduced in gravity to any serious extent, and the flow into the wells could not be said to be impeded by the oil becoming thick and viscous because of producing at high rates. In many wells in the Seminole field, water encroachment took place on a large scale, and the temperature remained almost as high as at the time of completion of the early wells. The gas-oil ratios here were not high, and in a general cross-section of this area in which some 40,000,000 barrels were produced, the average gas-oil ratio was approximately 700 cubic feet per barrel.

Conditions in the Oklahoma City Field

There is now not any pressure of consequence in the Wilcox zone wells in the Oklahoma City field. In fact a vacuum of about 5 inches of mercury is now carried on these wells, and the gas has gradually declined to the point where meters on the casing head show a ratio on the down-flank wells of only about 100 cubic feet per barrels, and yet the oil is not thick and viscous, and it enters these wells at the present time at the rate of up to 1000 barrels per day or more, and this is after some 350,000,000 barrels have been extracted from this reservoir. The gravity of the oil as produced is not much lower than it was when the field was first opened, at least not to the extent of seriously impeding the flow into the wells. This would seem to indicate that the loss of gas from the oil, so far as can be determined, has actually not caused any diminution of the flow into the wells by reason of increased viscosity. We have observed that when a reservoir is first penetrated, it is at its maximum pressure which tends to drive the oil into the well at a high rate. On the other hand, the effect of pressure is offset to an appreciable extent by the fact that the oil contains gas to the extent of 20 to 30 percent of the volume that the oil occupies on the surface, and an equivalent volume of oil must travel more rapidly through the sand to reach the well than if the oil were dead oil, thus setting up an increased friction loss over that of the flow of an equivalent quantity of dead oil,[5] consequently from that point of view it would be beneficial if all of the gas were denuded from the oil at the beginning, if only the pressure conditions did not also suffer from this action. Perhaps selective escape of gas has something to do with the process, in that the first gases to escape from the oil are methane and ethane, leaving the heavier gasoline vapors until the last, which makes the oil more fluid than otherwise would be the case, and therefore the oil does not increase in viscosity at the supposed rate. There is no active water drive in the Wilcox zone of the Oklahoma City field, and, as previously stated, wells are producing under vacuum without any water encroachment in many of the wells down the flank of the structure. It does not serve the purpose to maximum advantage to develop theories solely on the basis of laboratory experiments unless those theories square up with the action in the reservoir. There are many actions dependent on conditions and combinations of conditions in the reservoir that are not at yet known or recognized, and laboratory tests should endeavor to blend with these field conditions rather than to endeavor to make the field conditions square up with laboratory experiments and theories evolved therefrom.

Conditions in Fields With Water-Drive

In various fields where there is an active water drive, especially where the fields are deep-seated ones in which the sub-surface temperatures are naturally high, we find the oil being flushed out of the reservoir by the water, and the question of viscosity seems to have little bearing on the extraction results. Some of these fields in West Texas and on the Gulf Coast were produced at maximum capacity when originally discovered, and at the present time the percentage of oil accompanying the water is very low, indicating that there has been a high degree of extraction of oil.

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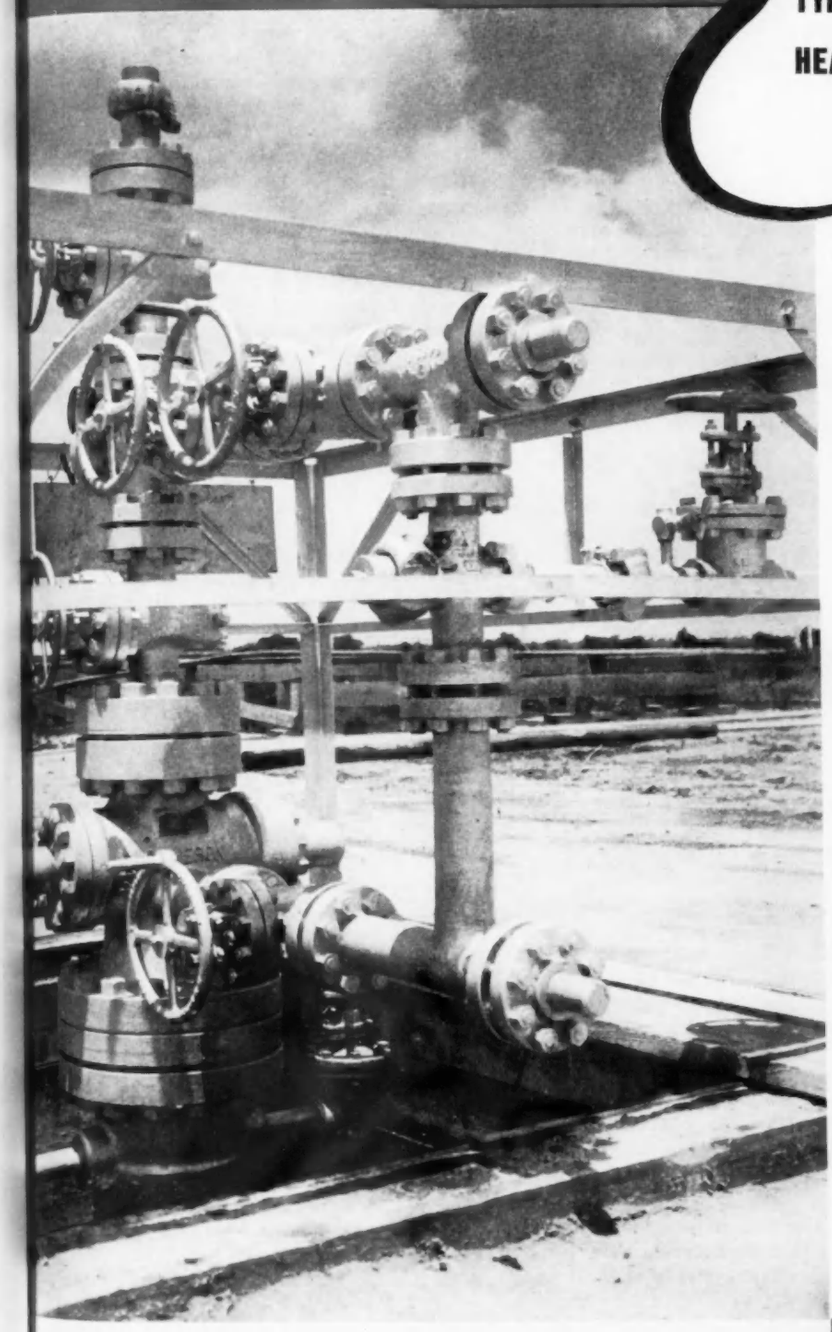

This well in the Ville Platte field, Evangeline Parish, Louisiana, like numerous high pressure wells throughout the Gulf Coast, was drilled, drilled in, and completed through Cameron drilling control and completion equipment. At no time during drilling or completion operations was the well without the protection of a Cameron control unit.

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Be Wise . . .
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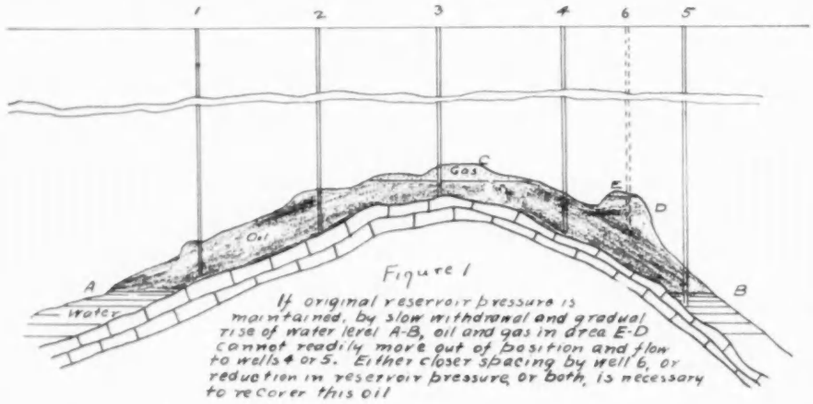
In various instances observed by the writer, and in other cases called to his attention, it has been noted that the production of the fluid at maximum capacity from these wells with low percentage of oil results in a higher percentage of oil in the fluid than when produced at low capacity. This may be due to the lowering of the pressure in the reservoir, thus allowing oil and gas that are trapped immediately under inequalities in the roof of the structure under the higher pressure to join the flow channel of fluid when the pressure is reduced. Hendrick, Luling, Salt Flat, Corpus Christi and various other West Texas and Gulf Coast fields are included in this type of reservoir. The sketch in Figure 1 illustrates this point. To reduce the trapping of oil by water, two remedies might be suggested; that is, closer spacing, and operating under pressure reduced to the minimum. This may seem just the reverse of ideas that producing at a high rate will cause oil to be trapped by water.


1
2
3
4
6
5
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C
E
D
Oil
A
B
Water
Figure 1
If original reservoir pressure is maintained, by slow withdrawal and gradual rise of water level A-B, oil and gas in area E-D cannot readily move out of position and flow to wells 4 or 5. Either closer spacing by well 6, or reduction in reservoir pressure or both, is necessary to recover this oil

Economics to Be Considered in Preference to Ultimate Recovery

Even if we assume tentatively that closer spacing and extraction at maximum capacity result in a greater ultimate recovery, it would not necessarily mean that this would be the proper program to follow in all cases. This would depend upon the relation between supply and demand, and upon the resulting price of oil. If the oil in fields now being exploited were to be opened to maximum capacity, and assuming that this condition were to be allowed to continue until the oil were all withdrawn as rapidly as possible, it would be necessary to build an enormous number of storage tanks to contain perhaps several billion barrels of oil. It would involve the expenditure of a billion or more dollars for storage tanks. It would involve an enormous fire hazard. If the oil were held in storage too long it would shrink gradually from loss due to exaporation of the lighter fractions, which are the more valuable products, and this would be absolute waste. In the meantime with this enormous storage of oil overhanging the market, the price probably would decline to the point where it might not pay to operate the wells for much of the oil produced. The economic waste would be great. In other words, under the assumed conditions of comparatively low demand, of production at maximum capacity, and enormous storage of oil, there would be waste far offsetting the loss in ultimate recovery that might be the result of producing at reduced capacity. There would be premature abandonment of wells due to the economic phase of the program, and this might mean a reduction in the ultimate recovery.

Therefore, no matter how one views the question of ultimate recovery from the reservoir, at present when there are large reserves of oil that can be supplied readily to the market, it would seem as if the only sane procedure is to keep the oil in the reservoir until it is needed at the surface.

The application of new and better primary methods of extraction, and also the use of secondary methods must be considered in the light of the economics involved, and not merely on the basis of the maximum ultimate recovery, and it would seem as if oil left in the reservoir as not economical to produce at a given time should not be considered as waste.

Waste Caused By Restriction Control Programs

At the present time, during programs of severely restricted production, waste in the reservoir is deliberately brought about by delaying extraction in fields where there is a heavy water encroachment, by limiting the production of such wells to the point where it becomes uneconomical to operate them, thereby causing abandonment. Wells producing at the rate of 2000 to 5000 barrels of fluid per day, containing 2 percent oil or less, are restricted in production to the point where they are abandoned. Such areas as Hendrick and Corpus Christi and similar fields should be opened to maximum capacity in order to obtain this oil while it is still possible profitably to extract it, and thereby avoid the waste resulting from such abandonment. It would seem such wells should be encouraged to produce at maximum capacity in order to attain real conservation. The additional oil that would be produced from such wells would not increase materially the total volume produced, and it would seem more nearly in order to restrict wells newly drilled, rather than cause abandonment of these older water wells. Once abandoned, it is doubtful whether such wells will ever again be opened to production, no matter what be the price of oil or the improved technique in recovery, because of the large expense of again placing the wells on production and the small amount of oil to be recovered, and, therefore, the doubtful outcome from such a venture.

The writer has recently seen wells making 4000 barrels of fluid per day with 1 to 2 percent oil closed in by regulatory bodies because of socalled over-production, yet wells in other fields were allowed to produce at rates several times as great. When the water wells were again opened to production, the percentage of oil was so low that they could not be produced at a profit, and the wells were abandoned. This is waste, if there ever was such a thing as waste, and yet it was done under the guise of preventing waste.

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[1] Schilthuis, Ralph J. "Connate Water in Oil and Gas Sands" A.I.M.E. Pet. Dev. and Tech. Vol. 127 (1938) p. 199.

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[3] Stephenson, Eugene A. and Grettum, I. G., "Valuation of Flood Oil Properties," A.I.M.E. Tech. Publication 323.

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[5] Uren, L. C., Domercq, J. and Mejia, J., "Influence of Well Diameter upon the Pressure Gradient and Rate of Flow of Oil . . ." A.I.M.E. Pet. Dev. and Tech. Vol 114 (1935) p. 25.

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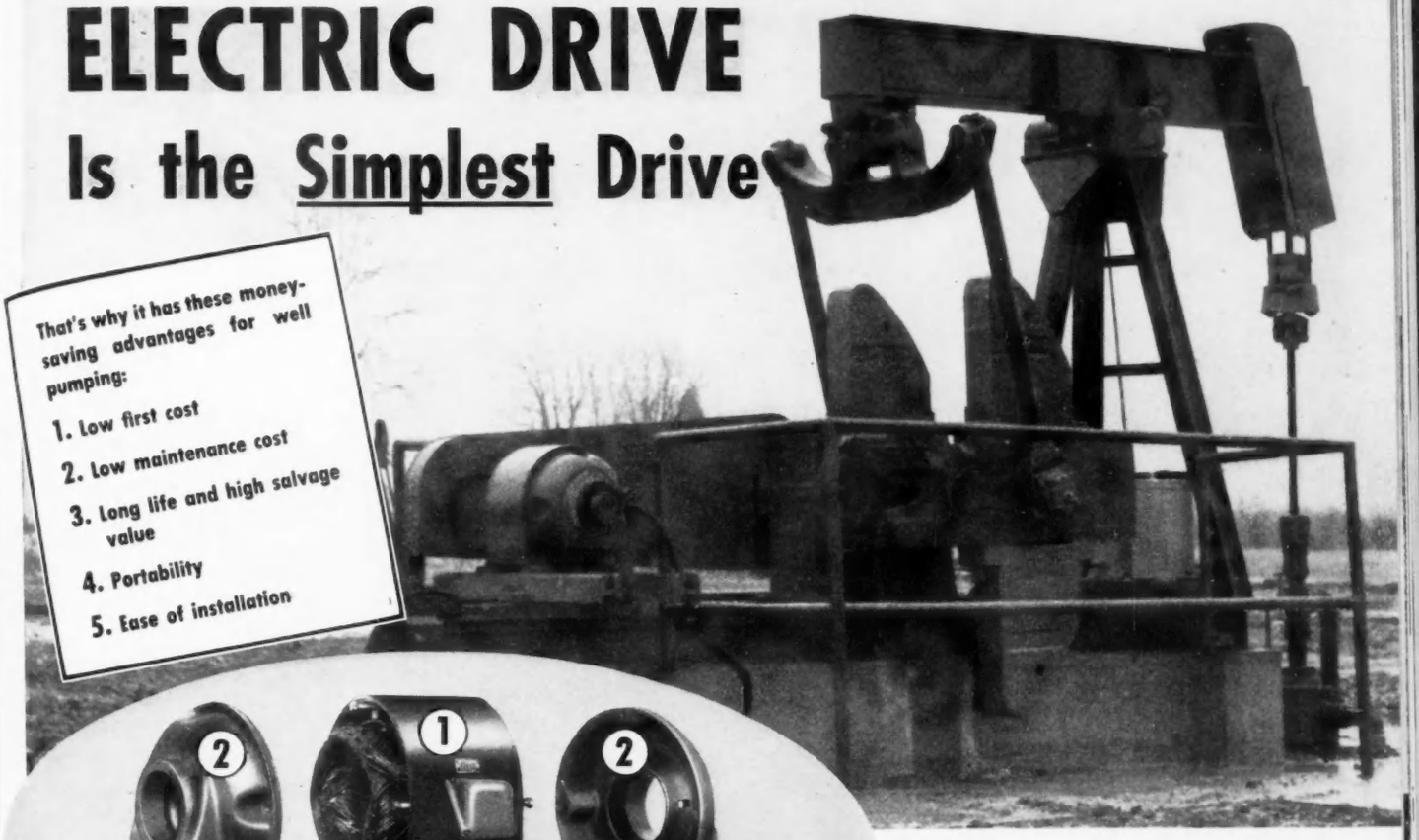

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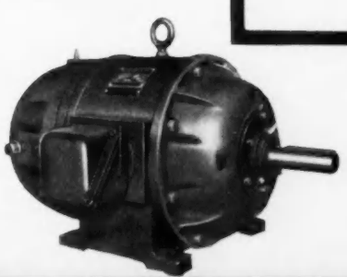

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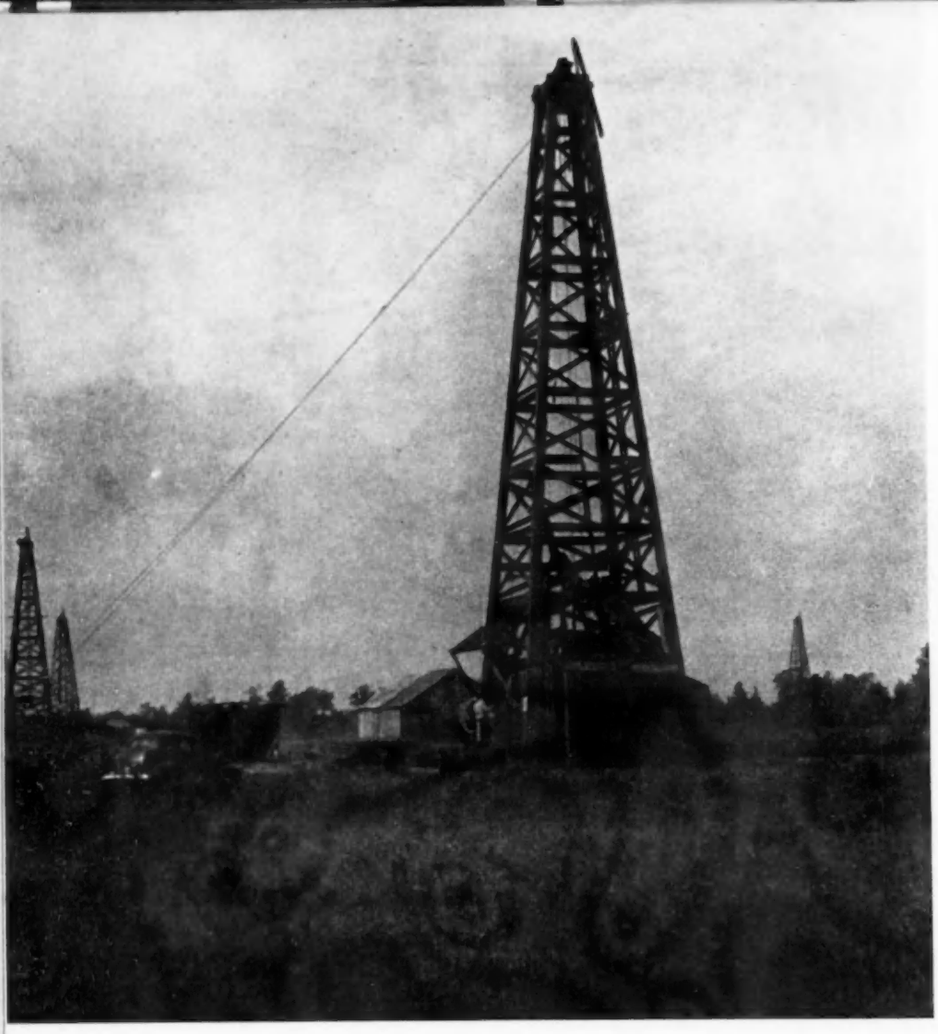

Carter Lease, Inc.'s Fee 6, section 18-13n-1w, Porter field, Midland County, (in foreground) originally completed in 3450 foot Dundee is one of two tests in Basin so far this year being carried to 5000 foot Sylvania sand. Porter field, opened in 1933, has recovered over 7000 barrels per acre to date—gross of 30,679,325 barrels at end of 1939, and still is producing about 100,000 barrels per month. No other pool in Michigan has approached this production record.

Michigan Alarmed Over Lag In Discoveries

By NORMAN X. LYON

ON June 1, Michigan entered its eighteenth consecutive month without an established important discovery in the face of a wildcatting campaign that has been pushed to record levels. Several important extensions, however, opened enough drilling areas to shatter all previous records in 1939 in both completions and total oil production.

Both production and drilling had started to slip in April, and pessimism was openly evident in many quarters. Independent refiners in particular viewed declining production as a serious matter, and some have made contracts for immediate or future exercising on Illinois crude commitments.

On the other hand, the state's major basin oil fields (Mt. Pleasant 1928, East Greendale 1931, Porter 1933, Crystal 1935 and Buckeye 1937) have been opened at approximate 2-year intervals, That the basin has not produced more pools the last 18 months can be attributed partly to a slowdown in wildcat exploration. Only 24 wildcats were completed outside of Southwest Michigan the first four months of the year; 97 in all of 1939; compared to 172 in 1938, 156 in 1937, and 162 in 1936.

This slowdown in basin wildcatting probably has a more direct effect on discoveries than in many of the other oil states. Subsurface interpretation, coupled with drilling, trend geology or chance, has accounted for virtually all of Michigan's discoveries in the past. Even core drilling to certain shallow markers cannot be counted on too strongly. So far geophysical work has not proven itself here.

Equally upsetting has been the dearth of important discoveries since 1938 in Southwestern Michigan—the land of milk and honey when you hit it. Sixteen wildcats opened one shallow pool in 1936, and 31 opened 3 in 1937, and 176 opened 9 more in 1938. With pools producing from depths of 1000 to 1900 feet, it took little more than a heavy duty post-hole digger to get to the Traverse limestone. Wildcats by the dozen were drilled on as little as 40-acre "blocks" and for as little as $1000.

Last year, 280 wildcats were drilled in Southwestern Michigan,

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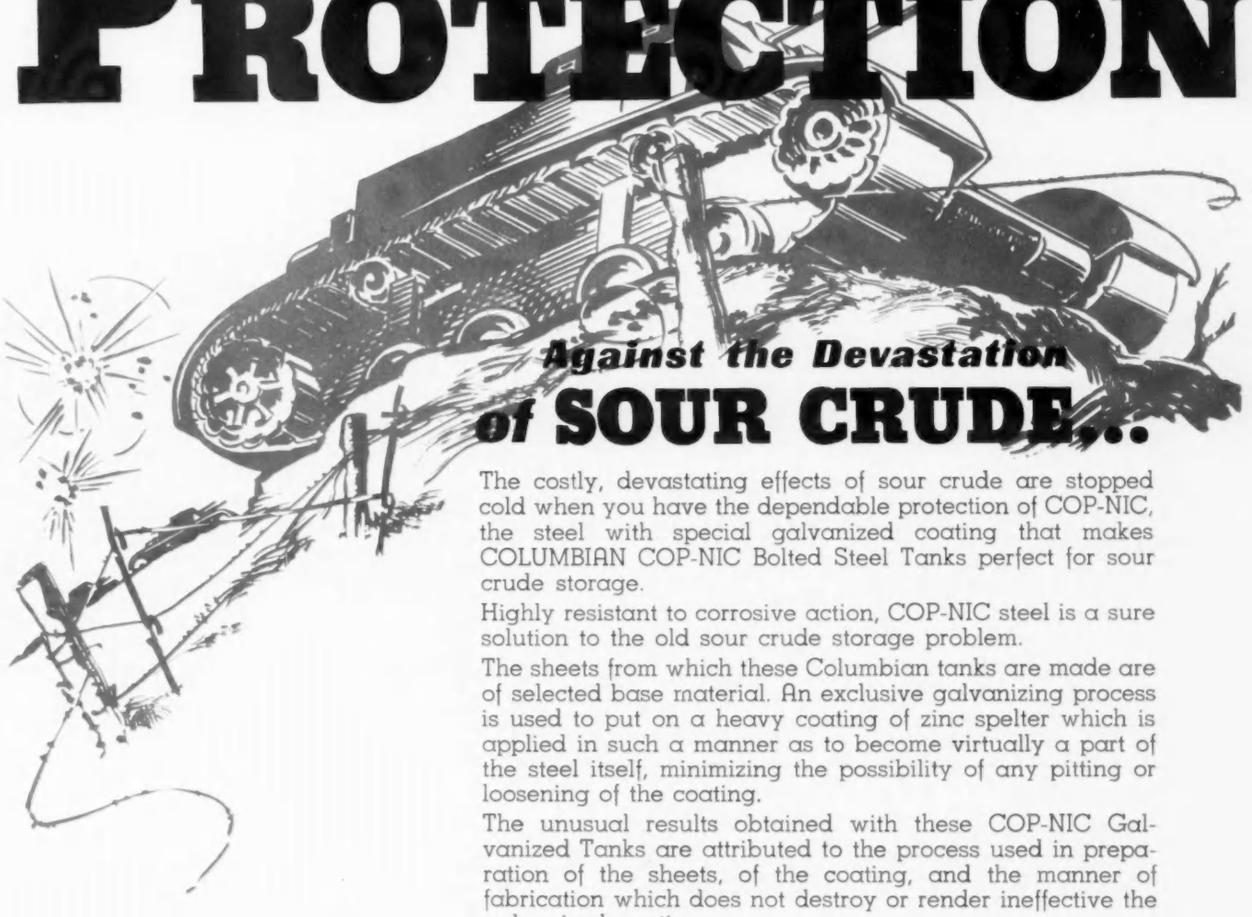

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(Right) A battery of Columbian COP-NIC Tanks in a sour crude district.

TABLE 1

Results of Michigan Wildcatting Since 1931

YEAR	SOUTHWEST BASIN				REST OF STATE			
	Oil	Gas	Dry	Percent	Oil	Gas	Dry	Percent
1940 (4 Months)	4	0	83	4.8	1	1	22	9.1
1939	11	2	267	4.9	3	0	94	3.2
1938	9	0	176	5.1	8	3	161	6.8
1937	3	0	28	10.7	4	0	52	7.7
1936	0	1	15	6.7	10	1	151	7.3
1935	0	0	12	.....	5	3	147	5.4
1934	0	0	9	.....	2	1	75	4.0
1933	0	0	9	.....	4	1	39	12.8
1932	1	0	6	16.7	1	0	33	3.0

scattered in Allegan, Kent, Ottawa, Van Buren, Berrien, Cass, St. Joe, Kalamazoo, Mason, Oceana, Muskegon and Barry counties, with 11 completed as oil wells and 2 as gas wells. None of the 11 were relatively important, and many apparently were nothing more than "one-well pools."

Out of 87 wildcats completed the first four months of 1940, four made oil wells but only one, in Heath Township, Allegan County, resulted in important development.

Through development and extension of pools discovered earlier, 1939 and the first five months of 1940 saw more drilling activity than the wildcat results might indicate. There were 697 shallow oil wells, 3 gas wells and 463 dry holes drilled in 1939, compared to 268 oil wells, no gas wells and 210 dry holes in 1938 in the same areas. For the first four months of this year, the shallow belt produced 176 oil wells and 118 dry holes, or about 13 percent more total completions than for the same four months last year. The rest of the state, including the basin, accounted for 101 completions to May 1, this year, against 108 for the same months last year.

Grand Rapids Largest of Shallow Pools

The shallow drilling play kicked off in Allegan County with the Salem field in early 1937, continued to gain momentum to the first of this year. Out of 16 fields, not including many shallow holes of short life, the Grand Rapids field just west of the city of Grand Rapids, Kent and Ottawa counties, ranks as the biggest from most any method of measurement.

This field had 386 producing Traverse lime wells as of May 1, covering 3810 acres developed, and had produced just short of 5,000,000 barrels, all-time. Per-acre recovery on a 10-acre drilled unit basis stood at 1280 barrels. Original estimates on total recovery for the field, which ranged up to 3600 per acre, now generally have been scaled down to 2400 to 2700 barrels per acre.

The estimated probable total acreage to be drilled in the Grand Rapids pool has been placed between 4300 and 4800 acres. About 20 strings of tools were active May 25, mostly concentrated on the northwest side, where definite borders to the productive area had yet to be established.

Discovered in the summer of 1938 by MacCullum & Herrs' Story 1, Section 32-7n-12w, Kent County, which produced only about 40 barrels of oil and water after acid treatment, the Grand Rapids field saw no important development until after May 1, 1939. The big drilling campaign started after Swanson Oil Company's Fletcher 1, in the same section as the discovery but ½-mile farther southeast, was brought in for 3200 barrels per day natural. As now developed, the field is over 6 miles long, northwest-southeast, and from ½ to 2 miles wide.

Excepting 3 wells which were being produced from the Berea at 1150-1200 feet, all Grand Rapids production is from the 1700-1900-foot Traverse limestone formation.

Grand Rapids field is credited with having been discovered by subsurface interpretation, using both old deep tests to the Traverse and drilling logs of several holes drilled for water. It is the most basinward of all the shallow oil fields in western and southwestern Michigan, with its axis on the northwest trend similar to most basin fields and contrasted to other shallow fields where the axes often have an east-west or northeast lift. The steepest slope is away from the basin.

Total closure appears to run about 75 to 90 feet, but production generally is obtained from only the top 30 to 60 feet of the closure. Two saturation zones generally prevail throughout the field, with the top pay from 3 to 8 feet below the top, and the second pay from 18 to 30 feet below the top. In certain areas of the field, particularly the central part, the top pay carries a big head of gas.

Studies of the pay formations have suggested that coral reefs probably played an important part in the location of the field.

About 70 percent of the wells drilled in the Grand Rapids field were with machines or spudders, with the others drilled with either standard tools and rig or with rotary equipment. Twin Drilling Company made the most extensive use of the rotary method, employing as many as three portable-type rotaries (the first ever used in Michigan of this type) to drill from surface pipe to 5-inch casing point, 1700-1900 feet, on an average of 4 to 6 days. Use of rotary eliminated from one to two strings of pipe and cementing jobs.

With cable tools, a 10-inch drive string ranging from as little as 60 feet up to 200 feet, is required. A second 8-inch string is required to be set and cemented or mudded through the Marshall, which carries brine and ranges from 350 to 500 feet. Where water or gas in quantity is found in the Berea, a third string, 6-inch, is required to be cemented, ranging in depth from 1100 to 1300 feet.

Costs in Grand Rapids

Cable-tool time ranges from as little as 12 days to 25 days. Prices generally are from $1.85 up to $2.25 per foot.

On a producing well basis with individual pump jack, the cost of a completed well in Grand Rapids has ranged from $6500 to $10,000. Lifting costs have been estimated from 3 to 7 cents per barrel for flush flowing wells, and from 18 to 30 cents a barrel for pumping wells. Only a few powers have been installed. A number of companies are using electrically powered units.

Paraffin has been a serious problem, especially in the winter months when operators have been forced to clean tubing and lead lines on an average of once every 10 days. Solvents to cut paraffin were being used extensively the latter months of the past winter, extending the time interval between tubing pulling jobs in many cases as much as 20 to 30 days.

Excepting in the early development of the field, confined to the central part, wells have been produced under a program designed to conserve gas and reservoir pressures. Original bottom-hole pressures ranged around 800 pounds

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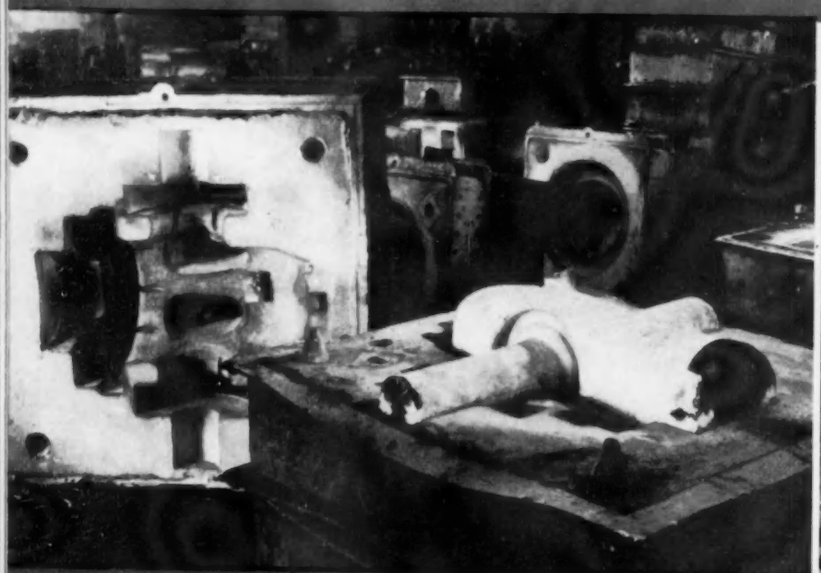

↑ Showing core in position in mould preparatory to locking up for the pouring of W-K-M 10,000-lb. test gate valve body.

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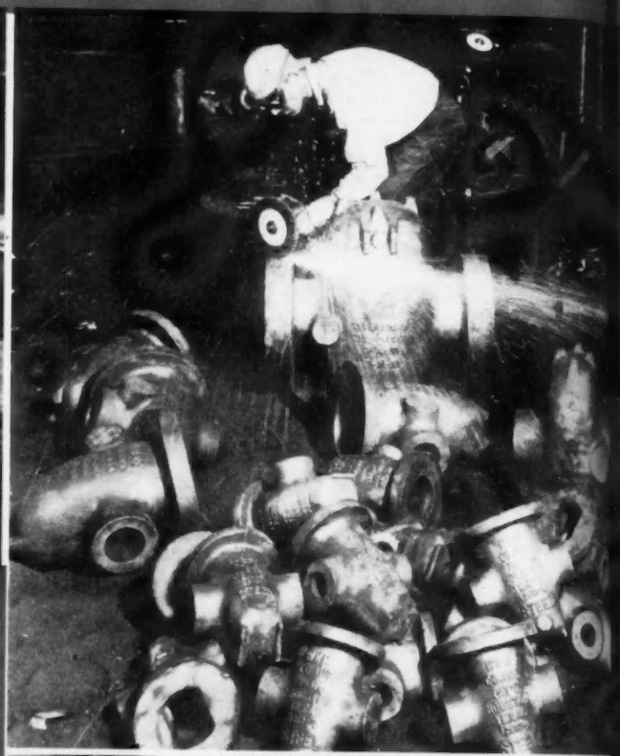

The finishing touches → on a W-K-M 10,000-lb. 7-in. gate valve body before final inspection in TESCO Foundry. Note also the 4-in. and 2-in. W-K-M castings.

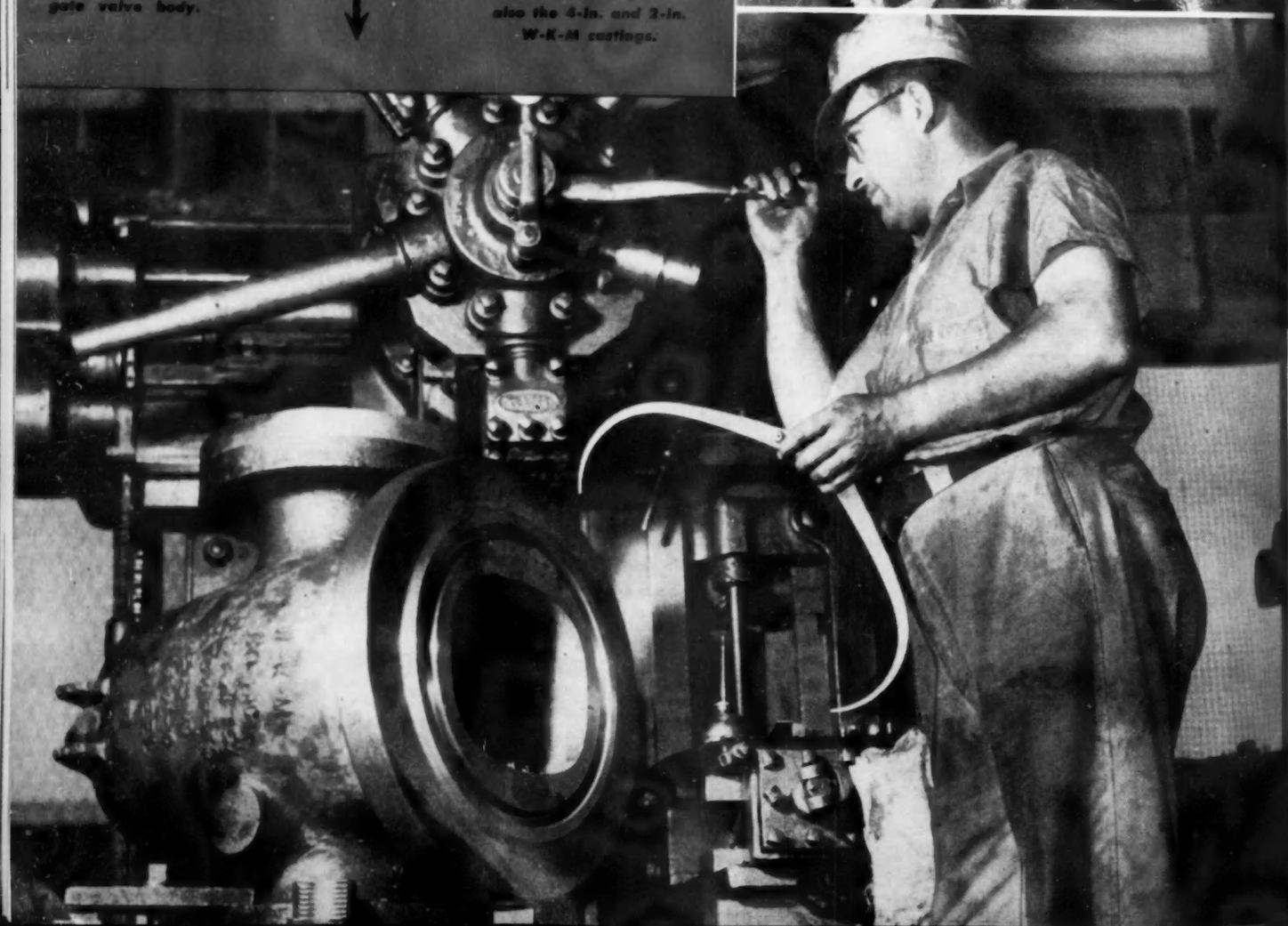

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TABLE 2

Trend of the Grand Rapids Field

MONTH	Wells	Allowable*	Pipe-Line Runs
October, 1939	151	450,249	413,300
November	214	610,608	482,145
December	260	770,536	533,241
January, 1940	297	875,694	565,878
February	326	912,850	530,672
March	355	1,059,051	523,427†
April	374	1,092,625	465,770‡
May	386	1,171,616	395,000

* Proration is based on flat per-well allowables. The first order under the 1939 conservation law fixed Grand Rapids field allowable at 200 barrels, effective June 1, 1939, on a 10-acre unit basis. The allowable was reduced to 100 barrels per well August 23, 1939, and had not been changed to June 1. The flat allowable, or field allowable, thus has no particular relationship today to ability of the field to produce.
† Unofficial. ‡ Estimated.

per square inch, with wells flowing until pressures dropped to or below 350 pounds. Starting in November, 1939, the State Conservation Department, Geological Survey, has conducted monthly bottom-hole pressure and fluid-level tests in the field on key wells.

Key wells showed an average of a 27 percent decline in reservoir pressure between November and March in the northwest part of the field; 25 percent for the same period in the central area; and 7 percent in the southeast area.

As of March 1, the northwest part of the field showed shut-in bottom-hole pressures from 581 to 797 pounds in the high-pressure areas, and 346 to 364 pounds in lower pressure wells. The central district showed highs of 341 and lows of 222 pounds, and the southeast district had highs of 444 and lows of 240 pounds.

State orders require that wells shall be produced through tubing, and a supplementary order early this year requires that casingheads must be kept closed on both flowing and pumping wells to prevent unnecessary waste of gas. Gas for field-operating purposes can be bled off.

Gas is the primary energy of the Grand Rapids field reservoir, as contrasted to water-drive energy in most of Michigan's larger oil fields. Gas/oil ratios averaged in the early flush development around 2000 cubic feet per barrel in wells with an upper gas pay, and about 800 cubic feet per barrel where the top gas pay was absent.

The Pent-Hex Corporation, an affiliate of the West Michigan Consumers Gas Company, has completed and placed in operation a casinghead gasoline plant in the Grand Rapids field which at the present time averages a throughput of 5,000,000 to 6,000,000 cubic feet of Traverse wet gas, taken off at lease separators. Average gasoline yield is 0.4 gallon per 1000 cubic feet, 90.3-gravity. Stripped dry gas is piped to Muskegon for industrial use. This is the first and only stripper plant for oil field gas utilization in western Michigan to date.

Water is not a relatively serious problem, although bottom-hole water is evident in many wells in certain areas of the field. In April, some wells showed as much as 50 percent bottom water compared to 1 to 2 percent edge water. There was evidence in April that some wells had been drilled too deep and that bottom-hole water was channeling from well to well.

An accompanying table, from the State Geological Survey records of monthly field allowables, shows the production trend of the field.

Unofficial figures set Grand Rapids field total output in April at 465,770 barrels and the first half production reports for May indicated that the total would be down another 65,000 to 80,000 for May. The field appeared to have definitely hit its peak in January, this year, and while new extensions might slow the present anticipated rate of decline, there seemed to be little chance that new drilling would completely equal the decline.

The Grand Rapids field produced a negligible amount in 1938, yielded 2,821,085 barrels last year, and 2,092,896 barrels the first four months of this year for all-time recovery to May 1 of 4,914,976 barrels or approximately 50 percent of the pool's total anticipated recovery.

Excepting the newest wells and isolated wells or leases in the older areas, the field in general was out of the flush class in May. The last available figures, as of March 11, showed 322 wells making 19,018 barrels per day for an average of 59 barrels each, with no data reported on 25 other wells in the field on that date. Only 90 of the 322 reported were making the state-set allowable of 100 barrels per day. As individual allowables are computed on a lease basis, it is possible that some wells were being helped by others.

In the peak production month, January, 1940, the proration division of the State Geological Survey reported as follows on well performance:

Total wells 316; average daily production 18,098 barrels; 59 wells (18.6 percent of total) were producing to 25 barrels per day for a total of 880 barrels daily, or 4.3 percent of the field output; 87 wells were in the 26-50-barrel range producing 3101 barrels per day; 69 wells in range of 51-75 barrels were producing 4116 barrels a day; and 101 wells in range from 76 to 100 (prorate maximum) were producing 10,001 barrels day, or 31.9 percent of the total wells were producing 41.4 percent of the total daily output.

Several of the other shallow pools have been widened or drilled up but essentially the story was told from a development standpoint in The Oil Weekly, July 17, 1939, "Southwest Michigan Offers Attractive Pay Out Rates."

Table 3 brings up-to-date the production and development standings of the more important areas.

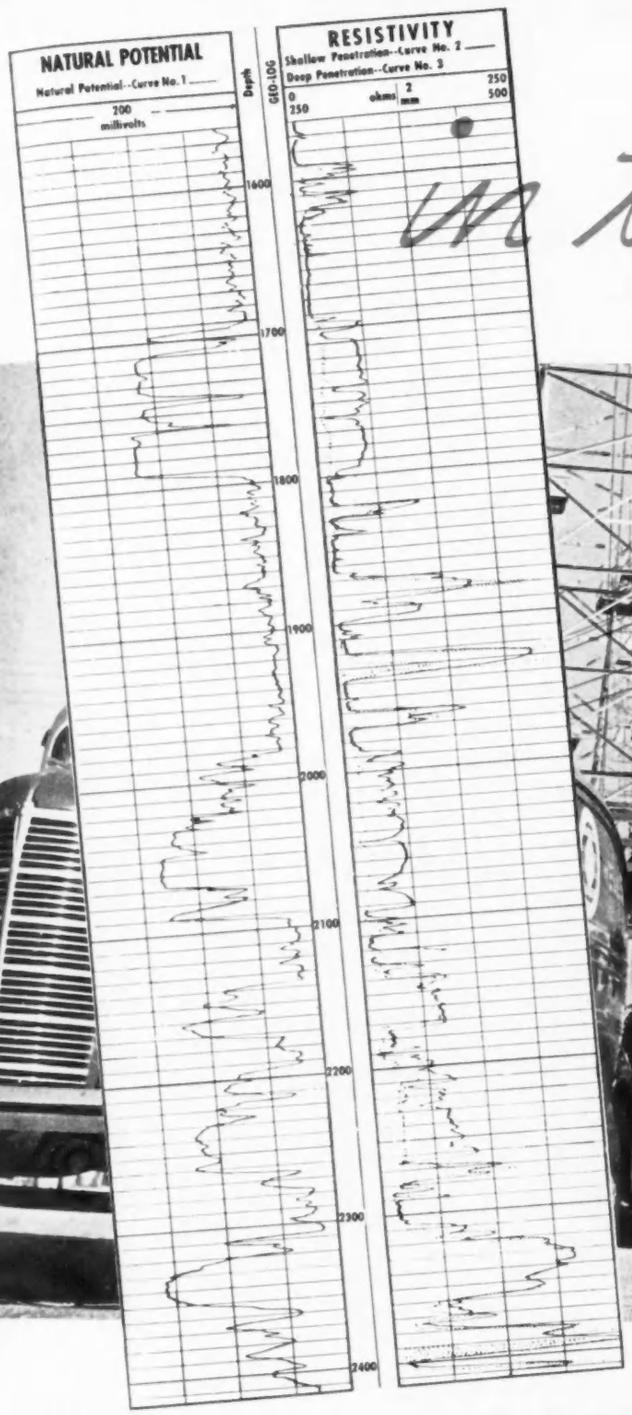
Western Michigan

Of the 1940 discoveries in Western Michigan, neither development nor production has been important to date, excepting in Heath Township, Allegan County, an area included by the State Geological Survey in production, proration and

TABLE 3

Standing of Michigan Shallow Areas

FIELD	COUNTY	No. Wells	Total Recovery	1939	Acres	Drilling
Bloomingdale	Van Buren	122	4,196,062	3,370,704	1290	1
Columbia	Van Buren	88	1,435,347	1,212,381	920	5
Old Salem	Allegan	153	2,238,260	749,891	1685	2
New Salem	Allegan	98	1,611,458	1,315,932	990	4
Overisel	Allegan	49	629,253	304,128	950	14
Diamond Springs	Allegan	33	585,000	130,396	410	0
Monterey	Allegan	22	284,000	57,136	260	0
Mill Lake	Van Buren	16	250,000	223,031	220	0
Bangor	Van Buren	13	81,130	77,672	150	2
Hopkins	Allegan	8	69,000	59,034	80	0
Wyoming Park	Kent	17	18,000	12,726	140	3
Grand Rapids	Kent & Ottawa	386	4,914,976	2,821,085	3810	25



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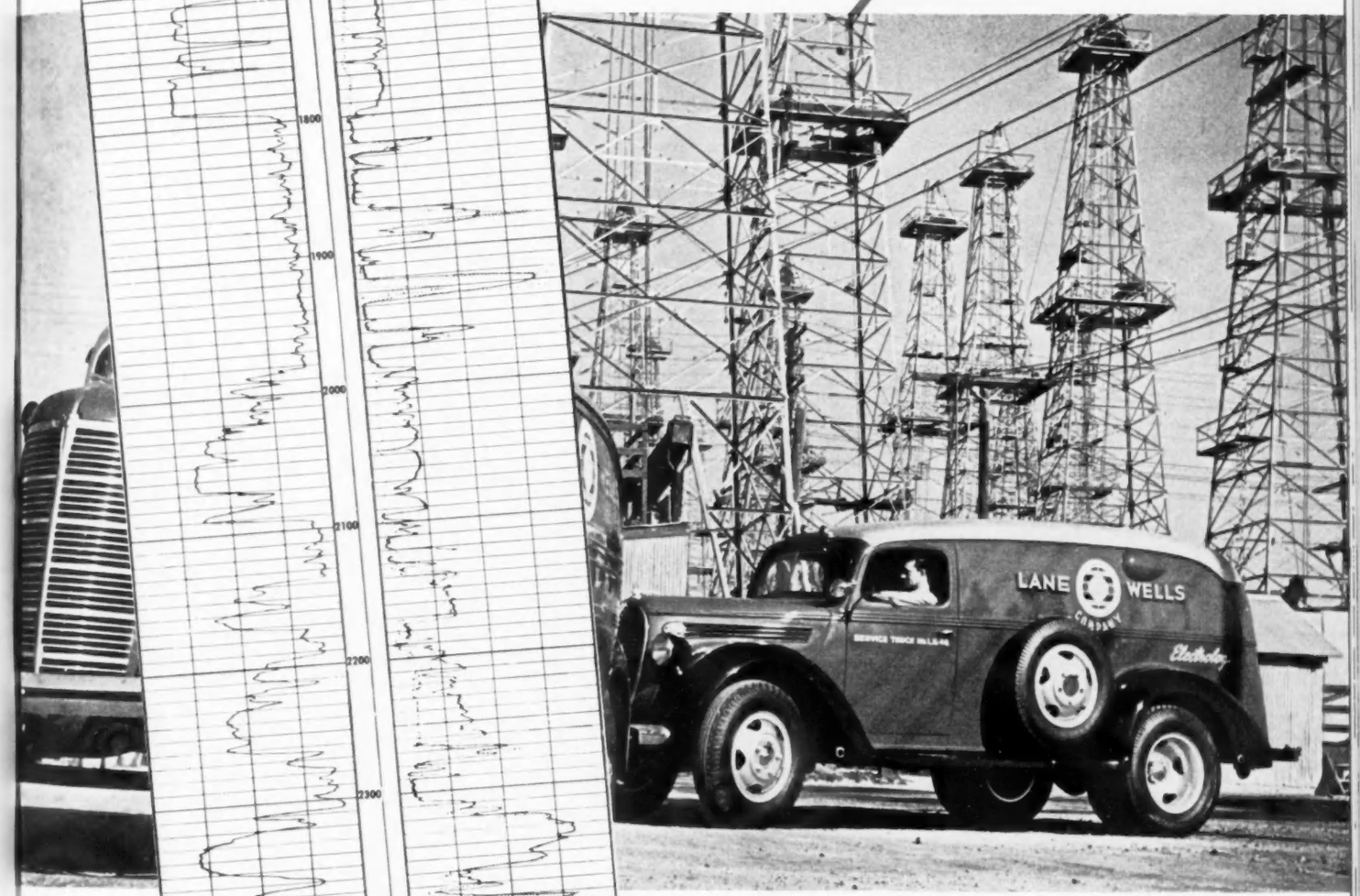

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drilling statistics with the older Overisel field.

One well, besides the discovery, has been drilled in Hope Township, Barry County, with only 70½ barrels of crude credited as sold during the first three months. No wells were drilling as of May 25. In Holland Township, Ottawa County, another of this year's discoveries, 12 dry holes had been drilled to May 25 without a second producer. The discovery produced an estimated 2000 barrels in April, a reported 2753 barrels in March and 930 barrels in February, month of completion.

Production credited to such 1939 discoveries as Silver Creek, Cass County; Porter, Van Buren County; Tallmadge "27," Ottawa County, and Zeeland, Ottawa County, was small.

Of the older shallow fields, production records of both Bloomingdale and New Salem are worthy of attention.

Bloomingdale, opened the summer of 1938, produces from an average depth of 1200 feet. Included in the field is the Bloomingdale townsite, covering 100 acres, in which 55 of the fields 149 oil-well completions were made. The field was drilled and produced out of the flush stage before state proration was instituted and there was no effective effort for voluntary control measures. As of May 1, this year, the field had recovered 3252 barrels per drilled acre, which is about double recoveries of most of the other shallow fields.

Bloomingdale is no longer active from a drilling standpoint, and production in April was down to 100,000 barrels. Wells were equipped to pump on an average cost of less than $6500 each, with a number of 4-well leases drilled and equipped for as little as $15,000. Bloomingdale has not had an equal in Michigan.

Strictly from an economic standpoint, however, many operators in the field are confessing now that the big over-rides they awarded to get leases, and failure to cut back production to market demand in late 1938 and early 1939, was a costly procedure. An estimated 30 percent of the field's first year production was moved from 75 to as low as 40 cents per barrel. The present price is $1.08.

The New and Old Salem fields, both in Salem Township, Allegan County, where producing conditions, original reservoir pressures and lime saturations were approximately at par, is now considered a fair example of the economic value of proration. Old Salem was discovered and largely drilled up in 1937 and 1938 without either state control or any effective pipe-line or operator control. Wells commonly were produced either through casing, without tubing, in the flow life, and with casingheads opened during the later periods. The average acre recovery stood at about 1300 barrels as of May 1.

New Salem, on the other hand, was placed under voluntary operator control immediately after the discovery was drilled, and, according to producers, was both drilled and produced through tubing and against back pressures. This form of control was superceded in the summer of 1939 by state control. Recovery per drilled acre in New Salem stood at 1778 barrels May 1, or better than 400 barrels per acre more than in Old Salem.

Started originally as an independent play, the shallow development continued this year to be mostly in the hands of the independents. However, Socony-Vacuum Oil Company and Gulf Refining Company have conducted active drilling campaigns, and the former company, in particular, has some attractive producing properties in New Salem to show for their efforts. Sun Oil Company, Transwestern Oil Company, Seaboard Oil Company and a few others have been active on a leasing and wildcatting basis, but to date have not moved into the producing column.

Should Pace Drilling This Year

With shallow wildcats being drilled about 4 to 1 for the rest of the state, and Western Michigan being by no means geologically exhausted, this district should continue this year to at least pace drilling. So far, since 1937, all commercial production developed in Western Michigan has been in the Traverse limestone. Only a few scattered wells have been carried below this formation. The Old Muskegon pool, Muskegon County, developed in 1927-29, produced from the Traverse, Dundee and Monroe. As of May 25, no test definitely up on structure had been carried below the Traverse in the Grand Rapids field, but at least a half-dozen deals for deep tests were in the fire. A 2200-foot well should test the Dundee and Upper Monroe. Some petroleum geologists look for older beds, such as the Sylvania, Trenton and St. Peters, to have more possibilities on the western rim of the basin than either the Dundee or Monroe.

Only one test in the current drilling campaign has been carried into the Trenton, Voorhees Drilling Company's Reible 1, Section 36-7n-16w, Grand Haven Township, Ottawa County, drilled to 4003 feet in 1939, and abandoned. Trenton top was set at 3850 feet.

While the comparative number of wildcats drilled by major companies has been small, these companies in most all cases have drilled below the Traverse to get data on the Dundee and Upper Monroe. Independents, on the other hand, in only a few instances have drilled ahead, once Traverse water had been encountered. The narrow margin of financing and casing programs generally have been responsible for immediate junking, even though another 100 to 300 feet of hole would have tested two other potential oil beds. Quitting at once with the objective lime also is further explained by the fact that independents have only in few cases had major company dry-hole support. Little is still actually known about beds below the Traverse, even in the face of the extensive wildcatting campaign.

As of May 20, there were approximately 13,445 acres in the shallow play which were producing, or had produced on initial drilling. This includes 2800 acres in the Old Muskegon pool. The rate of abandonment has not been high and is not expected to be so, since salvage is relatively small. There is no major water disposal needs in the majority of pools, and oil at $1.08 per barrel can be produced at 1200-1900-foot depths even when production is well advanced into the stripper stage.

While the spotlight has been focused since 1937 on shallow development, the basin and a few other outside basin districts, although slowed down, have not been completely transformed into ghost areas. The Temple pool in Clare County, discovered in 1938, and the Wise pool in Isabella County, discovered the same year, stand out as the two chief basin districts of recent development. Each of these now appear to be about drilled up and defined.

Temple is a 3800-3900-foot Monroe lime field, located on the same trend which previously produced such pools as Mt. Pleasant, Porter, Yost, Vernon and other smaller ones. It is the farthest northwest pool so far found on this trend.

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TABLE 4

Michigan Completions

YEAR	Total	Oil	Initial Production	Gas	Dry	Total Production
1940, 4 Months	395	237	51,909	5	153	7,703,910
1939	1,479	845	451,686	56	578	23,462,095
1938	1,018	580	234,344	27	411	18,744,709
1937	955	622	307,629	66	267	16,628,444
1936	807	333	73,045	206	268	11,918,013
1935	641	319	203,747	101	221	15,776,237
1934	469	272	217,653	47	150	10,602,759
1933	318	223	168,675	10	85	7,941,995
1932	179	110	65,000	9	60	6,925,665
1931	99	38	28,987	28	33	3,785,633

divided into two pools, Redding and Freeman, with a pronounced saddle separating the two. The Freeman pool is the smaller of the two, covering 580 developed acres, while the Redding pool now covers 1830 developed acres. Freeman was drilled on a 10-acre pattern, and Redding on a 20-acre pattern.

Costs and Power

Wells have cost, on a producing basis, from $19,000 to $26,000 each. An average well requires, where cable tools are used, 650 feet of 10-inch drive casing for the glacial drift, an auxiliary string of 1050 feet of 8-inch for a water zone, and 1750 feet of 6-inch cemented through the Marshall water zone. Rotary has been employed effectively, and at some saving in money as well as considerable time saving, to drill the first 1700 feet to the 6-inch casing point. Gulf Refining Company carried one test to completion with rotary last year. Below the 6-inch, ordinarily no other casing string is required until the top of the producing lime is reached.

The Pure Oil Company, which had 55 of the 91 wells in the Redding pool as of May 1, has installed powers for present and anticipated pumping needs. Other companies with smaller holdings are using individual jacks in most cases.

The energizing force in the Temple pool is a hydrostatic head, and unless wells are produced against back-pressures, water cuts in comparatively high amounts within a few hours. Water also has encroached considerably on field edges.

With voluntary proration for market reasons or to prevent flooding of the lime pay, instituted early in the life of the Redding pool, this pool still had more flowing wells for the number drilled than any other pool in the state in May. The Freeman pool, however, had only scattered flowing wells, with the reservoir pressure virtually dissipated months ago.

Since the first flat prorate of 400 barrels per well, proration has been cut by voluntary agreement even below the state allowable to 125 barrels per day. The state allowable is 150 barrels per day for 20-acre unit wells. Encroachment of water and evidences of coning has influenced the desire of operators to keep wells choked back.

On April 1, there were 72 wells out of 89 flowing in Redding. All flowing wells were reported capable of making the prorate of 150 barrels per day.

Shut-in reservoir pressures on key wells were reported at 1560-90 pounds, and only slightly down from tests taken earlier in the life of the field. The average gas/oil ratio in March was 450 cubic feet per barrel on wells produced through choke, and 700 to 800 feet on wells flowing open through tubing.

The Freeman pool has produced 4600 barrels to the acre from 570 developed acres on a 10-acre unit basis. Production was down to less than 50,000 barrels in April. Ultimate recovery is not expected to go beyond 5500 barrels to the acre.

Redding, covering about 1800 acres, has returned just over 1700 barrels per acre, and is expected to recover between 3800 and 4500 barrels per acre. With its present production of 385,000 barrels per month, and not more than 25 to 50 percent of the expected ultimate recovery now obtained, this field stands as a key area for immediate and future production requirements.

Wise field, Isabella County, likewise is a two-pool field, being structurally separated by a saddle, and as in Temple, the North pool covers the biggest area and so far has produced the best wells from an initial flush production standpoint.

Wise Field

Only four miles east of the Old Vernon pool, Wise apparently is on a parallel folding off the main structure. Production is from the 3700-foot Dundee formation. Ordinarily, wells are completed from 70 to 90 feet in the formation, although the top 30 to 45 feet seldom carries oil saturation. From two to three pay zones have been drilled.

Most wells carry a small amount of formation water, from 1 to 9 percent, although neither edge- nor bottom-water is expected to become a serious production problem. The gas/oil ratio is comparatively low, 250 to 400 feet per barrel, necessitating in most cases almost immediate acidization programs and installation of pumping equipment.

One or more companies, by careful attention and experimenting, have been able to keep wells flowing from the start as long as 12 months. Tests have indicated that the reservoir is very sensitive. This is due partially to the low gas/oil ratio, several localized conditions in the reservoir showing extremes of 93 to 1300 pounds shut-in pressure and lensing in the formation. McClanahan and White's Nixon 1, Section 17-16n-3w, North pool, which was still flowing 490 days after completion, would flow oil through 3/100-inch choke, only gas through 2/100-in choke and would die at a choke of 4-100 inches. Similar sensitive conditions have been reported on other wells and leases.

Wise was discovered in 1938, but was not brought into extensive development until the past winter months. There were 16 producers in the South pool and 34 producers in the North pool as of May 25. Ten others were drilling or rigs.

Unique to Michigan is the 20-acre diagonal spacing pattern which has been followed, 100 percent in the South pool and about 75 percent in the North pool. Only one company in the North pool rejected the diagonal pattern.

Initial production has not been high in either pool, ranging to a maximum of about 600 barrels after acid treatment. Declines are comparatively fast from these acid-created flush initials.

Because of the low initials, the state has not brought this field under proration restrictions. Testimony on the field was taken in March, and at this time, out of 28 wells, only 8 were reported capable of making 100 barrels a day or more. As wells were on a 20-acre basis, it was figured that proration would affect only a fraction of the production.

Also influencing the decision not to prorate was considerable evidence that operators on their own initiative were doing about everything possible to prevent waste, through maintenance of backpres-

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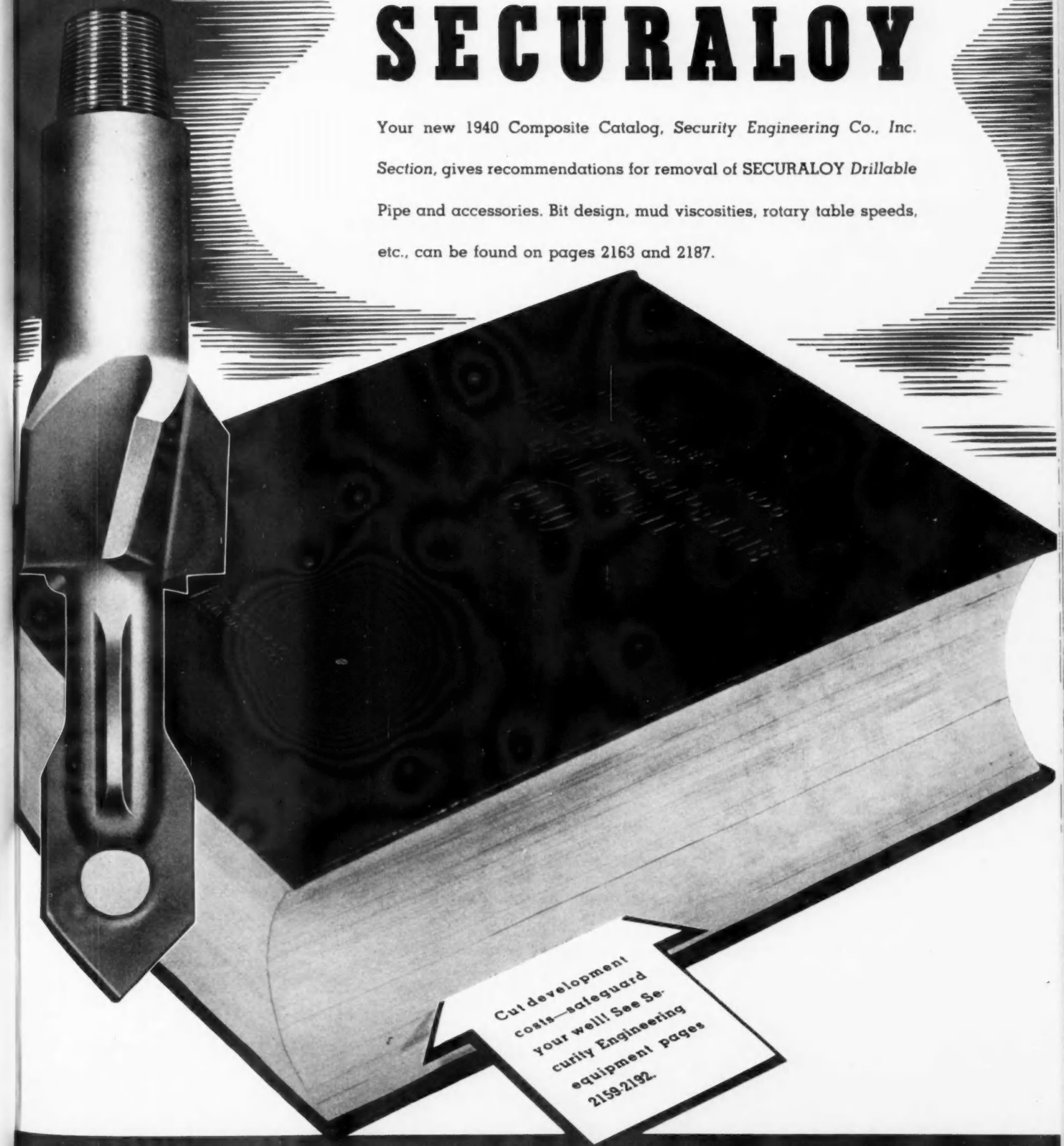

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sures, immediate running of tubing, and gas conservation.

The Wise field has approximately 1000 acres now drilled. Recovery, as of January 1, was only 841 barrels to the acre, but this had been decreased to around 600 per acre drilled, using 20-acres as the unit per well, by May 1. The past six-month campaign has increased acreage much faster than it has production. The output in April was 2817 barrels per day.

Unless new extensions are developed, Wise apparently reached its peak of drilling in May.

Southwestern Michigan Trenton Play

A revival of drilling in Southeastern Michigan late in 1939 for Trenton lime production near Dundee in Monroe County, while accounting for several completions, had not proven materially important up to June. Nine wells were estimated by the Oil and Gas Association of Michigan to have averaged only 353 barrels per day in April.

Little development has taken place to date in the Akron field, Tuscola County, discovered in 1938, due primarily to difficulties in marketing the oil. Crude has a comparatively high sulphur content, double that of Temple grade oil, and refineries have shied away from it after several experimental tests. An independent 1000-barrel topping plant was being constructed in May by Essex Refining Company near Bay City to provide a market for the Akron field. Producers interested in the field are financing the plant. If this development proves successful, more drilling may take place this year. Production is from the 3400-3500-foot middle Monroe limestone, about 800 feet below the top of the Dundee, and a different zone than from which oil is produced in the Temple and Sherman Monroe lime pools, in the top of the formation.

Any active basin drilling campaign this year now appears to rest almost solely on new discoveries. Wildcatting is more pronounced than in the 1939 period, but it still shows no aggressive punch. The biggest wildcatting efforts appeared to be aimed at opening the Roscommon, Osceola and Missaukee County areas. Sun Oil Company, The Pure Oil Company and Gulf Refining Company hold large blocks in these counties, and have been conducting extensive core-drilling campaigns the past year.

Although two tests, both in Midland County, were projected to the Sylvania sand, at about 5000 feet, in May, there appeared to be no significant trend for deep-drilling or development below the Dundee-Monroe beds in the basin.

Despite the shallow drilling trend in Michigan the past two years, the basin continues to be the chief source of the state's crude production. Following is a breakdown of state crude output the past five years:

Year	Basin	Western
1935	15,662,970	113,267
1936	11,825,284	92,629
1937	16,135,214	493,130
1938	16,290,671	2,454,038
1939	13,060,675	10,401,420
1940*	2,944,680	2,894,271

* Three months.

The Basin, with its backlog of old settled fields, has more than led in total runs. With shallow development tapering off, it is expected that the basin will continue to show a top margin of output.

Michigan's "in-sight" crude reserves were estimated at between 45,000,000 and 55,000,000 barrels as of January 1. Of this amount, approximately 20,000,000 barrels are assigned to the shallow pools. It would appear extremely doubtful that last year's shallow-pool output of more than 10,000,000 barrels could be equaled this year, without new pools, which would mean taking out half of the known reserve in 12 months. Past history indicates it will take five years or better.

The basin is in little better situation as to ability to maintain last year's run of over 13,000,000 barrels. A good part of the reserve long since passed out of the flush class, and to get 13,000,000 barrels from the basin, the Temple and Wise districts would have to do far better than is probable.

For the state as a unit, settled fields produced 8,499,037 barrels last year, and newer flush fields just short of 15,000,000 barrels.

April production figures showed the Grand Rapids field averaged 15,526 barrels per day, and Temple 12,861 barrels per day. This represented almost half of the April average of 61,040 barrels for the entire state.

Up to 1937, more or as much oil was being sold out of the state as was being called for in the state. Since that time, through refinery construction and expansion, the home market has been strengthened materially, with the result that out-state runs in 1939 represented only an estimated 20 to 30 percent of the total output. Ohio has been the major out-state market, with The Pure Oil Company, Sun Oil Company and Sohio Corporation as purchasers. For the past six months, out-state runs have been continually reduced to a point reported at only 5000 barrels per day in May. Nearly all of this was from shallow fields in Western Michigan.

Michigan independent refiners, who normally want from 40,000 to 55,000 barrels per day to meet refining needs, and not storage, have been getting more and more alarmed over the failure of new discoveries and the slackening pace of production the past three months.

Illinois has been turned to by one independent in Eastern Michigan for 3000 barrels per day, and others have made preliminary negotiations. However, Illinois oil unless bought for less than the posted Centralia price of $1.05 a barrel comes high when delivered in Michigan in the face of 97-cent oil in Temple, or even $1.08 oil in Grand Rapids.

The possibility that Michigan-Toledo Pipe Line Company, an affiliate of Sohio Corporation, will convert its 140-mile 8-inch line to run crude from Toledo north to Michigan plants has been actively dealt with by at least one big independent refiner. Such a move could, it is believed, bring Illinois crude to Michigan at parity with Michigan crude, considering certain refining advantages.

There is no question but that Illinois has for several months constituted a ceiling over Michigan crude prices, which in the face of tightening production have not reacted to any appreciable degree.

A recent price increase from $1.03 to $1.08 for Grand Rapids grade crude was instituted to discourage delivery of this oil in Ohio —oil which local refineries needed badly. At $1.08, crude which must be moved half the way by rail and then pipeline to Toledo is hardly competitive with Illinois crude. Sohio Corporation, only Ohio shipper out of Grand Rapids, has been moving less oil out-state since the advance, releasing much of it for local refinery markets. Refineries either at or close to Grand Rapids buy the bulk of the field's production, and without high transportation costs are able to operate on slightly higher field prices than others in the central part of the state.

It is difficult to arrive at but one conclusion, and that is Michigan needs new descoveries to avert troubled times for both the refiner and the producer.

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Skid-Mounted Pump Units Move From Well to Well

SOME Kansas operators find it expedient to use light-weight pumping units, and to move them from well to well to obtain lease allowable. Units so used are usually of the 5- to 15-horsepower class, unitized, and mounted on two parallel I beams serving as a skid. Gas or gasoline engines, or small electric motors, furnish the power. Trucks or pulling units are employed for transportation from one well to another.

The leases on which the portable pumpers are most widely used are those having relatively small daily production, with lifts of less than 2,000 feet. In some cases the normal fluid column is 2000 feet or less. A few attempts to produce from 3400 to 3600 feet have been made with the light equipment and while they were successful, the attempts were more in the nature of experiments than efforts to establish new practice.

Application of small portable pumping units to light production, and the moving of them about a lease, is the result of two trends. Of these, the first and most vital is the lowered per-well allowable, now averaging about 23 barrels per day per prorated well. The second is the trend established three years ago toward smaller diameter holes and well equipment. In many of the wells now being produced with light units, the oil string is 4½, 5 or 5½-inch. Tubing is 2 or 2½, rod is ¾-inch.

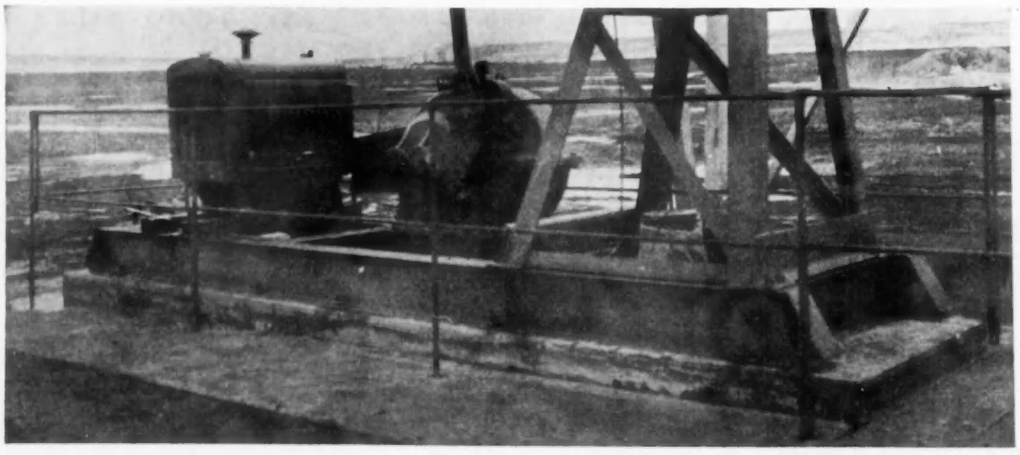
The stroke of the portable units is generally under 36 inches, although this usually can be increased by moving the beam crosshead forward. On the 5- to 10-horsepower units, the transmission is in line with engine power, but in cases where increased polish rod horsepower is required a larger transmission can be installed. With gas or gasoline engine for power these units weigh from 3800 to 5300 pounds, including skid. Electric power equipment decreases the weight about 350 pounds.

Application of the practice in Bemis, Ellinwood and other western Kansas fields has shown it requires about 1½ hours to make a move from one well to another on the same or nearby lease. This time is dependent upon the means of transportation, conditions of the terrain, and the speed with which a correct setup can be obtained. In this respect, the means of power is to be considered for if there are connections to make up, then the time may be a little longer.

In the application of the pumper to allowables and production, the unit may be used on one well to produce, then on another the second day, and on a third the third day. If the allowable per well on this three-well lease is 18 barrels per day, then from the first well the unit may produce 54 barrels. This is the amount of production allowed for three days, for the unit will be in service on other wells and tied up until the fourth day. The unit is rotated in this way between the wells of the lease.

Considering the depth of the well to the top of the fluid column to be 2,000 feet, regardless of the total depth of the well, and that the column is being skimmed, then a unit lifting from this depth with ¾-inch rod is showing a polish rod load of a little less than 6500 pounds. The majority of the lighter units show a smaller polish rod load due to pumping from a lesser depth down the hole. In cases where it is necessary to lift large water volumes, the light unit cannot suffice.

In considering the economics of the practice, a number of the units that have been in steady service for some months have shown not undue wear. However, the loads must be watched and the machine must not be over-taxed. Transportation is a major item; the number of moves required, their length, time and terrain conditions, labor and maintenance must all be considered in determining practicability.



Detail of skid or framework mounting the light-weight units. Skids are I beams, double braced and nosed up at ends to facilitate moving.

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EAST TEXAS

This bit, hard-set with Haystellite cast tungsten carbide inserts and hard-faced with Haystellite tube rod, went in at 100 feet, just below the surface pipe, and drilled 2,506 feet of out-to-gauge hole, including 40 feet through the Pecan Gap chalk.

NEAR BAKERSFIELD, CALIF.

These wall-scraper blades, hard-set with Haystellite inserts and hard-faced with Haystellite tube rod, are well-fingered after being used for 198 feet in enlarging a well—a severe test of the abrasion resistance of Haystellite inserts.

TEXAS GULF COAST

This bit, hard-set with Haystellite tungsten carbide inserts, is one of several which made from 310 to 360 feet each in tough going through hard lime and shale formation.

CANAL FIELD, CALIF.

This 8½-inch bit, hard-set with Haystellite cast tungsten carbide inserts and hard-faced with Haystellite tube rod, was still drilling out-to-gauge hole when pulled after drilling 1,119 feet.

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DRILLING CONTRACTORS' NOTEBOOK

Helpful Suggestions For Those Interested In Drilling Methods

Operating Ideas Maintenance Hints New Rig Hook-ups

Published as a regular feature of THE OIL WEEKLY

1. PIPE HANDLING

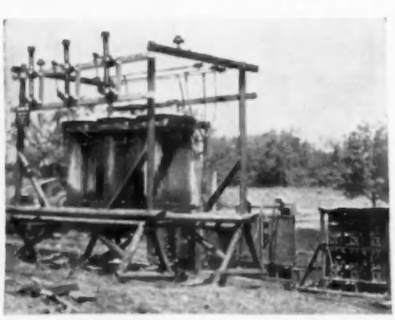
Pivoted Bar at Base of Drill-Pipe Skid Eases Transfer to Derrick Floor

A pivoted bar on base of drill-pipe skid enables joint to be placed with minimum effort and eliminates one cause of injury by making heavy lifting unnecessary.

EACH length of drill pipe, rolled from the storage pile into line for dragging to the derrick floor, must be stopped at the edge of the skids and lifted onto them unless the skids can be depressed sufficiently to allow gravity placement over the entire pile of pipe.

By bending the flattened end of a short piece of two-inch pipe and pivoting it at the end of the flattened section, a lever is provided with which the joint may be lifted onto the skids. Ample compounding of force is applied to enable two men to place the pipe without the exertion required were simple lifting relied upon.

The bar is usable throughout the range of the entire pipe stack by working the lower tiers from the farther side until the end of the lever is reached, and then rolling the remaining joints back far enough to clear the lever.



These transformers are supported by a foundation of three welded units.

2. POWER

Transformers Held By Welded Rack

THREE separate welded units are used in the foundation supporting three heavy transformers at the rig of Noble Drilling Company in the Cumberland pool, Marshall County, Oklahoma.

The lower support consists of two triangular racks of 4⅝-inch pipe, each resting on wooden blocks to give proper elevation. A welded rectangular upper structure upon which the transformers rest was made of 6⅞-inch pipe, each vertical leg member strengthened by a diagonal member welded intact at the base.

The rack is easily portable, and offers ample support for the heavy transformers.

3. PIPE HANDLING

Buffer Block Protects Pipe Threads

EVEN when safeguarded by a snubbing rope, drill pipe and casing sometimes swing against the rotary table with force enough to damage threads and render the joint unfit for service. Additional protection, supplementing the rope, may be provided by a heavy timber mounted ahead of the table and

A buffer block, mounted before the rotary table, checks swinging pipe or casing without damage to threads.

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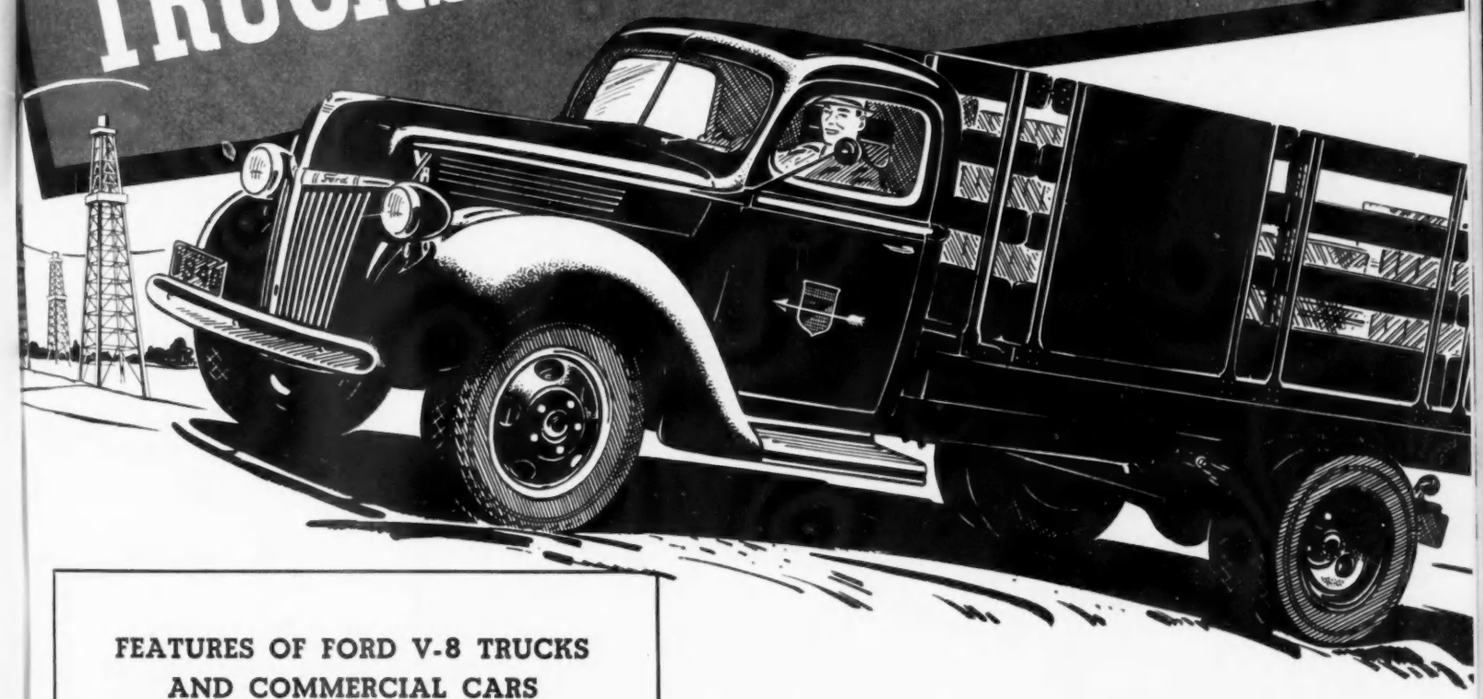

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of equal height with it. This buffer, while strong enough to stop the swing of the pipe, is soft enough to yield and prevent thread damage.

The buffer enables the men handling pipe to stand to either side of its swing, instead of being obliged to stand directly between it and the rotary with greatly increased danger of injury in case of accidental release of the pipe.

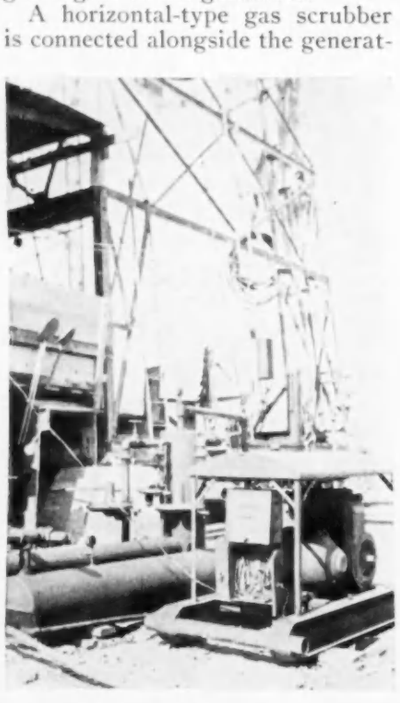
4. RIGGING UP

Generator and Scrubber Well Arranged

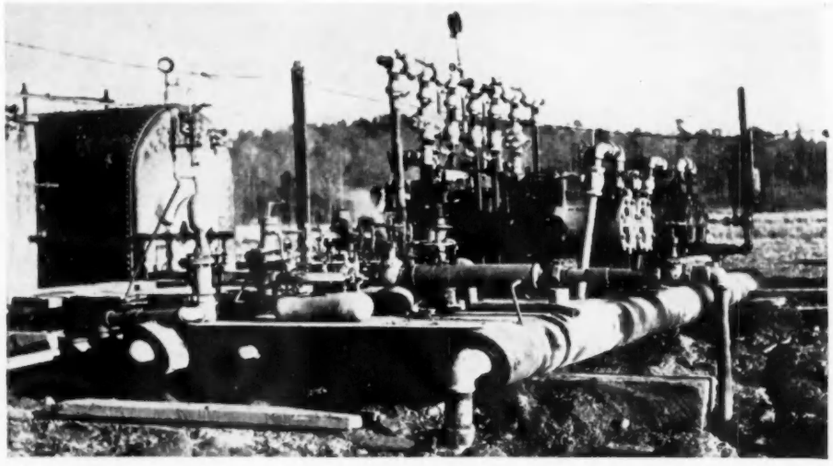
A CONVENIENTLY arranged gas-engine generating unit and gas scrubber are features of the rig of Kirk - Green - Way, Inc., in the Coyle pool, Payne County, Oklahoma.

The generating unit is mounted on an I-beam skid-type base and may be easily winched to a truck for transfer to a new location. A V-belt transfers power from the gas engine to the generator.

A horizontal-type gas scrubber is connected alongside the generating unit to supply clean gas to the drilling engines. Three regulators control gas volume at the scrubber.



This gas - engine powered generating unit and horizontal scrubber are features of a Kirk - Green - Way rig.



Use of pump and control platform skids for a feed-water heater reduces bulk.

5. TRANSPORTATION

Skid-Platform Houses Feed-Water Heater

WEIGHT and bulk of drilling equipment, sometimes of value while actually drilling, must be kept at a minimum if shifts to new locations are not to require excessive transportation facilities.

An example of double-duty units is the skid-platform unit used by Triangle Drilling Company to support the boiler-feed pumps and control panel. The skids themselves are formed from large-diameter pipe, conventionally beveled at the ends, and carrying within them 3-inch pipe through which the boiler feed water is circulated. Exhaust steam from the pumps is discharged into the annular space between 3-inch and skid pipes, and in condensing there transfers a part of its heat to the incoming feed water. When in the move, the feed-water connections are broken out at the skid end, and the unit moved in the usual manner.

This combination does away with the cumbrous feed-water heater usually employed, while use of over-size pipe for skids affords extra security to the foundation for the feed-water panel.

6. TRANSPORTATION

Protect Master Gate By Skid Base

TO prevent possible damage to threads, stem or bolts of a pressure - operated master gate, the unit may be moved on a special skid with a channel-iron base that snugly encloses one flange of the unit, while a cradle carries the other end of the barrel and prevents side shifting.

Paired eye bolts, passing through heavy springs, afford fastening points for a chain, passed around the body of the gate, and provide a means for maintaining the unit in place even over rough roads. Heavy eyes on the body of the unit serve to affix hook or chain when handling the unit by winch line.

These skids on the master gate permit faster handling and help prevent damage to the threads, stem or bolts.

HIGHLIGHTS IN THE WEEK'S NEWS

Allowables

Thompson Comments on Rowan & Nichols Decision

Texas Railroad Commissioner Ernest O. Thompson last week issued the following statement concerning the Rowan & Nichols Oil Company suit:

"The United States Supreme Court, in the celebrated case of Rowan & Nichols, has given the Railroad Commission of Texas a solid-rock foundation for our orders in proration and conservation of oil in the East Texas field.

"The court points out first that the proration statutes are constitutional by saying 'Its constitutionality is here settled; citing Champlin Refining Company vs. Commission. The court clearly points out that writing a statute is only the beginning. It must be administered. The manner of its administration is up to the commission. It is the task of the commission to solve the intricate problems that grow out of conflicting interests of the owners.

"All the various law suits say the courts are but episodes in the evolution of proration. It is the job of the commission to do those things that will ultimately serve the purpose of the statute. The method to be used is for the commission to choose, and it is not within the province of the courts to substitute their will or opinion as to their ideas of which is a better method for the discretion placed in the hands of the commission by the legislature. The courts are not permitted to say here is a better way to do it. The court cannot dominate the regulatory body by striking down our orders just because the court doesn't like the method used. Those are not matters for judicial judgment. They are exclusively in the realm of the regulatory body.

"This opinion and decision is the most far reaching of any case I have read in putting regulatory and administrative bodies in a fair field unhindered so long as they are reasonable. It admits that perfection is hard to get. We can use hourly potential or a percentage of it, or any other system that is fair. The decision is a landmark in regulatory efforts and means stability for the oil business.

"The opinion says plainly it would be presumptious for courts, on the basis of conflicting expert testimony, to deem the view of the administrative tribunal, acting under legislative authority, offensive to the fourteenth amendment.

"It looks like the court is not going to let the fourteenth amendment serve any longer as the haven for all those who do not like some regulatory order. It was never so intended by the framers, anyhow.

"The court clearly points out that to deny the small tract owners the right to drill might subject them to the risk of losing their oil, or being put at the mercy of adjoining holders. This is the most important part of the decision. It heartily and fully upholds my theory that a man has got a right to drill an oil well on his land no matter how small his tract. The court recognizes that the effect of these small operations upon the state's economy is an appropriate factor to be taken into account when plans are devised to give all wells a share. Here is a new note in United States Supreme Court decisions. It is the coming order of the day. It is contra to the old hard harsh view that did not consider the general economy—the general good to the state."

To Revise Etex Allocation In Line With Court Decision

Revision of the method of allocating production in the East Texas field will be ordered June 18, according to Lon A. Smith and Jerry Sadler, members of the Texas Railroad Commission.

The plan contemplated calls for restoring proration on the basis of 2.32 percent of the hourly potential, which is the proration formula that formed the basis for the Rowan & Nichols Oil Company suit and which has been specifically upheld by the United States Supreme Court. The commission plans to provide a sufficient number of shutdowns for East Texas to keep the total field allowable at approximately 420,000 barrels daily, an increase of some 30,000 barrels in the total daily production in that field.

In addition, the commissioners said they would restore cuts in the Texas Panhandle by fixing a minimum allowable of 20 barrels per well. In order to qeep the total Texas allowable within market demand, several fields in the Gulf Coast which produce low-octane, high-gravity crudes will have reduced allowables.

In referring to the change in East Texas, Smith and Sadler declared the judgment in this case will become final June 18 in the event Rowan & Nichols Oil Company does not file a motion for rehearing. Should the company take that action, the commission will institute the order with exemption for the Rowan & Nichols lease involved in the suit.

No hearing will be necessary, the commissioners said, and none is contemplated now.

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Washington

Control Proposed If Foreign Situation Becomes More Grave

Legislation giving the federal government immediate control of the oil industry in the event the United States becomes involved in war, or if necessary because of further European developments, is being written although it may not be introduced in congress at this time, it was learned this week.

The measure, it was said, would be based upon studies which are being made by United States Department of the Interior experts of the available reserves of oil and oil products.

No details of the proposed legislation have been made available, but it is understood that the oil subcommittee of the House Interstate and Foreign Commerce Committee, headed by Representative William P. Cole, Jr., has been requested to remain available throughout the summer and fall so that in the event of emergency it can immediately undertake consideration of the bill.

While Chairman Cole has not yet made any announcement of his plans, it is understood he will keep his committee intact until the new session opens next January. Under the resolution creating the subcommittee for the purpose of bringing its 1934 study of the oil situation up to date, it is not required to file a final report until January 1.

Prior to adjournment of the current session, the subcommittee plans to make a preliminary report of its investigation, setting forth its findings but making no recommendations.

No action is planned on the administration production-control bill which was the subject of extensive hearings by the committee last year and this spring, and interest in that legislation has waned in view of the graver emergency which confronts the Nation.

Congressional leaders unanimously deny that they have received any definite proposals for war-time control of the industry, but the report has been in circulation for many weeks that administration officials are considering legislation giving the president absolute control over all exports of petroleum and petroleum products as well as control of domestic production, in

order to assure adequate reserves for the army and navy.

Oil industry representatives deny the need for any government control, and at various times during the past few weeks have assured congressional committees that the industry is organized for full corporation with the administration in its national defense program and is capable of meeting any demand for oil which may arise out of that effort or even out of the involvement of the United States in war.

Commission Orders Defense Survey of Texas Fields

A national defense survey of the Texas oil industry was launched by the Texas Railroad Commission last week. Commissioner Ernest O. Thompson instructed the Oil & Gas Division of the commission to prepare maps of each Texas oil field, and to make a statistical survey of the production and a chemical analysis of the crudes produced in each field.

In his letter to John E. Taylor, chief supervisor of oil and gas, Thompson urged that the data be prepared promptly. He asked that maps show pressure and gas/oil ratio histories of the fields as well as the location of each well.

Statistics on depletion of oil and gas in each field are to be prepared and placed on the maps.

Thompson pointed out that the funds were available and could be obtained through the state Limitations Payment Board. He urged that the work go forward on a day and night basis.

Change Venezuelan Agreement Lowered California Prices

Imports of low-cost foreign oil under the Venezuelan reciprocal trade agreement have resulted in crashing the California price structure, forcing small refineries to close, at an estimated cost to California producers of $1,500,000 a month, it was charged last week by Representative Wesley E. Disney, of Oklahoma.

Attacking the agreement during debate in the House on the new national defense tax bill, under which the levy on gasoline would be increased from 1 to 1½ cents per gallon, on lubricating oils from 4 to 4½ cents per gallon and on transporation by pipe line from 4 to 4½ percent, Disney charged that, contrary to the experience under agreements with other Latin American countries, imports from Venezuela have shown double the increase exports to that country showed during the first three months of this year as compared with the same period in 1939.

Imports of foreign oil, as a result of the agreement, were 123 percent greater during the first four months of this year than for the corresponding period a year ago, he said.

"Further evidence of the harm being done to domestic producers by the large imports since the reduction of the excise taxes is shown by the quantity of domestic crude oil that has been forced into storage," the congressman told the House. "Excess above-ground storage creates waste, and the state regulatory bodies seek to avoid such waste by bringing supply into balance with demand. In doing this, their efforts may be offset by uncontrolled supplies of foreign oil. Such has been the case since the Venezuelan agreement gave encouragement to the importers."

Disney told members from the consuming states that there is no basis for the argument that an adequate excise tax will deny consumers the benefit of low prices, pointing out that the imports are controlled by a few large companies who he charged also dominate the water transportation of these shipments.

That the lower excise tax has brought no benefit to the consumers, he asserted, is demonstrated by the increases in the prices of heavy fuel oil for ships' bunkers in New York although there was no corresponding increase in the prices in the Gulf or Mid-Continent area.

Disney offered no opposition to increased oil taxes, but Congressman Frank Carlson, of Kansas, attacked the increase in the gasoline tax as imposing an additional burden of $6,000,000 a year on the farmers of the country.

"The Administration has just presented to a few wealthy companies importing foreign oil a rebate of half the tax they had formerly paid on imports of crude oil and fuel and gas oil," he declared. "Now it is proposing to take from the farmer millions of dollars a year by increasing the tax he must pay on his gasoline. To him that hath shall be given millions of dollars through the reduced excise taxes on foreign petroleum while from him that hath not, such as the farmer, shall be taken away through increased taxes even that which he hath."

A.A.P.G. To Convene In Houston April 2-4

The American Association of Petroleum Geologists last week scheduled its 1941 convention for April 2-4 at Houston. The Houston Geological Society will be host, and members from the San Antonio, Fort Worth, Dallas and Tyler groups will assist.

The selection of city was made following a mail canvass of members.

Oil-World Exposition Holds To Plans for 1942 Show

The executive committee of the Oil-World Exposition last week voted to hold a 1942 show at Houston, setting the dates April 11-18, a month before the Internation Petroleum Exposition at Tulsa. The action came after officials of the Tulsa show rejected for the third time a proposal for one show every two years, alternating between Tulsa and Houston.

John R. Suman, vice president of the Humble Oil & Refining Company, is president of the Oil World Exposition. Other members of the committee are Frank S. Carothers, George A. Hill, Jr., Gordon Richmond, Wallace D. Wilson, J. S. Abercrombie, Chase E. Sutton, W. L. Childs, Joe H. Russell, R. L. Dudley and Walter B. Sharp.

South Texas Line

Magnolia Pipe Line Company will provide a pipe line connection and market outlet for the Lolita pool, recent discovery for Jackson County, Southwest Texas. The company awarded contract to Williams Brothers for the laying of a 6-mile 6-inch welded line to connect with its 8-inch trunk line at a point 7 miles north of the West Ranch field.

Labor

Appeal Court Reverses NRLB In Magnolia Petroleum Case

Magnolia Petroleum Company was awarded a decision in its appeal against a recent ruling of the National Labor Relations Board which was heard by the Fifth Circuit Court of Appeals in New Orleans June 20.

The board had found the company guilty of intimidating employes who were active in a C. I. O. affiliated union, and was ordered to cease the practice. In addition, a company-sponsored union, the Employees Independent Union of Oil and Refinery Workers, Local No. 1 of Beaumont, Texas, was ordered dropped. The company also was found guilty of not allowing employes the right of collective bargaining by a union of their own choosing.

In reversing and setting aside the findings and order of the board, the court said:

"In its capacity as a trier of facts, the board stands on the footing of a jury. Like a jury it must be impartial. Like a jury it may not make findings without evidence to support them, and as in the case of a jury it is for the courts to say whether there is or is not evidence in support.

"We think it plain that the findings in this case are based on nothing but suspicion, surmise, and conjecture; that they are wholly unsupported by the evidence, and the orders based on them cannot stand."

Plan Short Course on Recycling Operations

Preliminary plans for a short course on "Condensate Recovery and Recycling Operations" have been announced by Dr. F. H. Dotterweich, associate professor of natural gas engineering at Texas College of Arts and Industries, Kingsville. The course will be held in fall.

R. L. Peurifoy, Kingsville, is temporary chairman of a committee arranging the course program. He is being assisted by E. E. Deback, Corpus Christi; E. V. Foran, San Antonio; C. H. Gee, Bishop; Jack Winters, Baytown, and Dr. Dotterweich.

Among topics under consideration by the group are: A Survey of Condensate Extraction and Recycling Operations; Condensate Production and Recycling—an Example of Conservation; Operation of the Podbielniak Low-Temperature-Fractionation Apparatus for Complete Analysis of Natural Gas; Physical Properties of Hydrocarbon Mixtures in Condensate Production; Testing and Sampling Methods Used on Condensate Wells; Deviation of Natural Gas from Boyle's Law; Compressor Design and Operation in Recycling Work; Gas Hydrates; Unitization Relative to Gas Condensate Fields; The Flow of High-Pressure Natural Gas Through Sand and Output Wells; Estimation of Wet Gas Recovery in Recycling Operations; Report on Work Conducted at the University of Oklahoma, Sponsored by the American Gas Association, Relative to Condensate Recovery; Condensate Recovery by Extreme Cooling with Dehydration; Condensate Recovery by High-Pressure Oil-Absorption process, and Natural Gasoline Recovery by Dehydration and Refrigeration.

MEN IN THE INDUSTRY'S NEWS

STANDARD OIL COMPANY (NEW JERSEY) NAMES EUGENE HOLMAN AND FRANK W. ABRAMS TO BOARD

»

C. H. LIEB AND CHESTER SMITH TO HEAD SUBSIDIARY OPERATING COMPANIES

»

EUGENE HOLMAN, president of Creole Petroleum Company and Lago Petroleum Company, South American operating subsidiaries of Standard Oil Company (New Jersey), and Frank W. Abrams, president of Standard Oil Company of New Jersey, chief operating subsidiary, have been elected to the board of the parent company.

C. H. Lieb, vice president of Creole Petroleum Company and a former president of The Carter Oil Company, is scheduled to succeed Holman. He started with the Standard organization in 1917, was transferred a year later to Tampico, Mexico, as a draftsman in the engineering office, was given a number of promotions and in 1926 became president and general manager of the Mexican subsidiary. Chester Smith will succeed Abrams. Formal elections of Holman and Smith will take place at special meetings of the boards of the subsidiary companies.

G. H. Smith, president of Imperial Oil Company, Toronto, resigned as a member of the Jersey board to devote his entire time to the Canadian subsidiary.

Holman, following service in the United States Army Air Corps during the World War, joined the United States Geological Survey. In 1919, he joined Humble Oil & Refining Company, becoming chief geologist in 1925. He left the company in 1929 to become assistant to E. J. Sadler, vice president of Standard Oil Company (New Jersey).

Abrams, a civil engineering graduate of Syracuse University, started with the Standard organization 28 years ago as draftsman in the Eagle Works, Jersey City. He became manager of the Eagle Works in 1922, and also assumed charge of the company's refinery at Parkersburg, West Virginia. Four years later he was appointed general manager of the company's three New Jersey refineries, and in 1933 was elected president of Standard Oil Company of New Jersey.

FRANK ZARSKY, Woodsboro, Texas, is head of the recently organized Fech Oil Company, composed of property holders in the LaRosa field. The group has started a well on the Zarsky tract in a program of developing their own lands. Others in the company are E. P. Zarsky, J. L. Zarsky, Ludvik Zarsky, Mary Zarsky, J. E. Williams, L. S. Zarsky, C. F. Zarsky and H. V. Smaystrala.

JEROME McLESTER, West Central Texas producer with headquarters at Graham, cabled British Prime Minister Winston Churchill at London last week an offer to donate 50,000 barrels of crude to the Allies. He stipulated that the Allies bear the pipe line and tanker charges, and make the necessary arrangements with the Texas proration enforcement bureau to produce the specified amount of oil from his wells.

TOM S. COX, former West Texas district geologist for Plymouth Oil Company, and more recently engaged in consulting work in Southwest Texas, has moved to Fort Worth to specialize in magnetometer operations.

R. L. TOLLETT, secretary-treasurer of Cosden Petroleum Corporation, Fort Worth, since July, 1939, was elected president of the firm June 10. He succeeds Henry Zweifel, who resigned to resume his law practice and to personally direct operation of oil properties acquired in Young County, Texas, prior to his election as president in April, 1938. Zweifel will continue as a member of the board and chief counsel.

R. L. TOLLETT

Tollett, a native of Wichita Falls, was employed by independent oil companies from 1925 to 1933, specializing in accounting and auditing in Wichita Falls and Dallas. Qualified to practice law, he became a special agent for the Federal Bureau of Investigation in 1934. Resigning in March, 1937, as head of the New Orleans district office, he moved to Fort Worth to join Wrightsman Oil Company. This connection was terminated to accept an executive position with Cosden Petroleum Corporation.

A. V. Karcher, certified public accountant succeeds Tollett as secretary-treasurer.

Zweifel announced last week that Cosden Petroleum Corporation, which engages in producing, refining and marketing operations in West Texas, during the year ending April 30, 1940, had earned, after fixed charges, a net profit of $215,681.95. This compares with a loss of $203,966.45, after fixed charges, the previous 12-month period.

CARL BRYAN, member of Gulf Oil Corporation's research staff stationed in Denmark since September, 1938, and Mrs. Bryan, were vacationing in Houston last week. They left Denmark three weeks after the Nazi invasion on visas permitting them to pass through Germany and Italy, from where they embarked for the United States.

LEONARD PHILLIPS, secretary of Davies Petroleum Company, was elected president and managing director of the Alberta operating company to succeed Maynard J. Davies, who asked to be relieved of the duties of active management. Davies was named vice president, and E. F. Lowick took over the duties of secretary-treasurer.

RYOZO NIIJIMA, Komao Tachikawa and Shigeru Yamanouchi, engineers in the field operation department of Nippon Oil Company, Marunouchi, Tokyo, Japan, are in Houston for three weeks while on a tour of United States oil fields. They are stopping at the Rice Hotel.

MURRAY WELLS, geologist for Indian Territory Illuminating Oil Company at Lawton, and Jerry Newby, Oklahoma City geologist, reviewed development and geology of North Texas before the Oklahoma City Geological Society last week.

JAMES PARKER, manager of Texas-New Mexico operations for Arrow Drilling Company, Tulsa, has established a district office at Fort Worth in the Neil P. Anderson building. He was formerly located at Midland. W. S. Churchill, Tulsa, is president of the firm.

MRS. HELEN BECKER has resigned as geologist for Amerada Petroleum Corporation, Tulsa, and has been succeeded by Marian Coffman, University of Oklahoma graduate. Jane Eckle, graduate of the University of Tulsa, also joined the geological staff of the firm.

I. W. ALCORN, Gulf Coast division engineer for The Pure Oil Company, discussed "Marine Drilling" at the monthly meeting of the Gulf Coast Section of the American Institute of Mining and Metallurgical Engineers, held in Houston, June 11.

EDWARD GALT, president of Maryland Corporation, announces removal of the company's offices from Georgia to San Antonio. The company has production in Nueces County, and is drilling several wildcats in South Texas.

D. H. CADDELL has been named acting drilling and production superintendent of Mene Grande Oil Company's field at Oficino, Venezuela, following the death of C. C. Ghio.

WILLIAM ASH WAID, oil inspector at the Osage Agency, Pawhuaka, Oklahoma, will retire from active service on September 2, at the age of 65.

Runs to Stills Cut and Gasoline Stocks Decline

A reduction of crude runs to stills and a decrease in gasoline stocks were favorable features of the industry's statistics for the week ended June 8. The increase in the winter supply of light fuel oil also was a favorable indication. On the other hand, crude oil production and crude stocks sharply increased.

Gasoline stocks fell to 99,471,000 barrels, the lowest level since March 9 of this year. This was a decrease of 882,000 barrels from the previous week. The industry had gradually built up gasoline storage to a peak of 102,817,000 barrels for April 20, 1940. Since that time stocks have gradually decreased, although they still are about 20 percent in excess of last year's stocks.

A slight increase in motor fuel exports and an increased demand in the Middle West and Mid-Continent areas, coupled with the desire for stabilization of the gasoline market, have been the principle factors in the decline of gasoline stocks. Until these stocks are still further greatly reduced, however, little can be expected towards a stronger gasoline market.

Production and Runs

United States crude oil production was up sharply in the week of June 8, an increase of 163,300 barrels daily. The American Petroleum Institute reported a daily production of 3,816,950 barrels, or 196,650 barrels over the estimated market demand for June. The production was 13 percent in excess of that for the same period in 1939.

Crude runs to stills were down 51,350 barrels daily, in spite of the increase in daily crude production, having averaged 3,600,000 barrels daily. They were 3.2 percent larger than the daily average for June of last year.

In reflection of relatively large production, crude oil stocks have continued to increase. They jumped 4,015,000 barrels in the week ended June 1, according to the Bureau of Mines. However, at the new level of 261,662,000 barrels, they still were 6 percent lower than at the corresponding time last year.

In spite of the smaller runs to stills, stocks of light fuel oil rose 1,076,000 barrels in the week of June 8, as the seasonal build-up continued. The relatively large additions to these stocks lately has reflected efforts of refiners to be prepared for anticipated heavy consumption next winter, the desirable results being achieved by the taking of relatively large yields of fuel oils and proportionatelly smaller yields of gasoline, supplies of which are too large.

A withdrawal of 102,000 barrels was made from residual fuel oil stocks in the week of June 8, although prices lately have weakened.

Although the markets for heavy fuel oils lately have become unstable, as evidenced by declines in prices, 102,000 barrels of those oils were withdrawn from storage in the week ended June 8. Increased industrial activity has drawn much of the heavy fuel oil from storage, and a decrease of 6.2 percent from a year ago is indicated.

Prices of Products Are Generally Unchanged

Prices of refined products the past week continued generally the same as in the preceding week, except for further sagging of heavy fuel oils along the Atlantic Coast and declines in Mid-Continent lubricants.

Gasoline prices remained steady, with demand materially improved in the Mid-Continent and the Middle West. Although the total gasoline stocks dropped the week ending June 8 in every section of the country except the Texas Gulf Coast and Northern Louisiana and Arkansas, the reduction was not large enough to affect prices, due to the large oversupply of gasoline still in storage and the continued poor showing of motor fuel exports.

Kerosene and light fuel oils held their own after several slight drops in price the past few weeks. Seasonal marking-down of quotations seems to have diminished, with a consequent stabilization of the market.

In spite of the apparent stepping up of industrial plants to meet the increased demands of the national defense program and the possibility of larger industrial exports abroad, heavy fuel oil prices remain generally at lower levels to which they have declined in the past several weeks, and it is indicated that a disruption of shipping and exports throughout the world is responsible. However, some improvement got under way late last week in the primary markets on the Gulf Coast, as demand apparently began to reflect the expectations of larger industrial activity in connection with the national defense program.

Mid-Continent lubricating oil prices took further reductions of from ½ to 2½ cents a gallon in spite of heavy domestic movement. Western Pennsylvania bright stocks were down in price also, but without as wide a variation in price as in the Mid-Continent. Heavier exports are needed to restore firm markets for lubricants.

PRODUCT PRICES

REFINED GASOLINE

	Range Last Week (Cents a gal.)	Late Week	Changes from week Before	
Oklahoma Refineries:				
60 Octane and under	4	4¼	...	...
63-66 Octane	4¼	4¾	...	...
72-74 Octane	4¾	5¼	...	...
Mid-Western Tank Car:				
60 Octane and under	4	4¼	...	...
63-66 Octane	4¾	4¾	...	...
72-74 Octane	4¾	5¼	...	...
New York Harbor:				
70 Octane and under	6¼	6¼	...	...
72-74 Octane	6	6¾	—¼	...

NATURAL GASOLINE

Grade 26-70:				
F.O.B. Group 3	1½	1½	...	...
F.O.B. Breckenridge, Texas	1¼	1¼	...	...

KEROSENE

Oklahoma Refineries:				
41-43 water white	4	4¼	...	...
42-44 water white	4⅛	4⅝	...	...
Mid-Western Tank Car:				
41-43 water white	4	4¼	...	...
42-44 water white	4⅛	4⅝	...	...
New York Harbor	5½	—6	...	...

RANGE OIL

At Oklahoma Refineries	3⅜	3⅜	...	...
In Mid-Western Market, Group 3 basis	3¾	3⅜	...	...

LIGHT FUEL OILS

Oklahoma Refineris:				
No. 1 straw	3¾	3⅝	...	...
No. 3	3¼	3⅜	...	...
Mid-Western Tank Car:				
No. 1 straw	3½	3⅝	...	...
No. 3	3⅛	3⅜	...	...
New York Harbor:				
No. 1	5½	—6	...	...
No. 3	4¾	5½	...	...

HEAVY FUEL OILS
(Per Barrel)

	Range Last Week (Cents a gal.)	Late Week	Changes from week Before	
Oklahoma Refineries:				
No. 6	50	55	...	...
Mid-Western Tank Car:				
No. 5	75	75	...	...
No. 6	45	55	...	...
New York Harbor:				
No. 5	$1.55	$1.70	—.15	—.15
No. 6	1.35	1.35	...	—.15

BUNKER C FUEL OIL
(Per barrel, ships bunkers)

Gulf Coast	$ .80	$ .95	...	...
New York Harbor	1.35	1.35	...	—.15

DIESEL OIL
(Per barrel, ships bunkers)

Gulf Coast	$1.50	$1.70	...	...
New York Harbor	1.95	2.20	...	...
Los Angeles Basin, 27 gravity	1.15	1.40	...	...

LUBRICATING OIL

Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	16½	18½	—½	—2½
Neutral oil, pale, No. 3 color, 150 viscosity at 100°, 0-10 pour test	9½	11¼	...	—½
Western Pennsylvania:				
Bright stock, 145-155 viscosity, at 210°, 25 pour test	18	19	—1	—1
Neutral Oil, No. 3 color, 150 viscosity, at 70°, 25 pour test	20	20	...	...

Production Up as Illinois Establishes New Record

The continued increase in Illinois output to a new all-time high was instrumental in causing a 20,000-barrel gain in United States crude oil production during the past week, ended June 15, the national output having averaged 3,831,350 barrels daily. That was 211,050 barrels a day more than average daily market requirements for domestic crude in June, as calculated by the United States Bureau of Mines.

Illinois continued to surprise the many oil men who had thought several weeks ago that the state was beyond its peak and on the way down, as new fields more than offset further declines in the two largest producing areas, Salem and Louden. The new Illinois high established last week, 471,100 barrels daily, was approximately 14,000 barrels above the previous peak of 457,200 barrels daily reported by the American Petroleum Institute for the previous week, ended June 8, when the state surpassed its former record set in the middle of March. At last week's rate, Illinois was producing about 75,000 barrels a day more than the indi-

cated market requirements for the state's oil.

California also was importantly responsible for the increase in United States production, having turned out 637,200 barrels daily, or 12,400 more than in the previous week and having exceeded market demand about 45,000 barrels daily.

Texas showed a 4600-barrel gain in averaging 1,400,800 barrels daily and overproduced indicated demand 56,200 barrels daily.

Louisiana output rose 2200 barrels to 295,300 daily, which was more than 20,000 barrels above estimated demand.

Kansas production increased about 20,000 barrels to 170,650 daily, and was 11,650 barrels above indicated market requirements.

Unlike the other leading states, Oklahoma showed a decline, from 437,100 to 406,650 barrels daily. The new rate was slightly under estimated demand.

Crude Runs Up 15,000 Barrels in April

Crude runs to stills in April averaged 3,566,000 barrels a day, an increase of 15,000 barrels over March and 256,000 barrels above April, 1939, it was reported June 12 by the United States Bureau of Mines.

Total crude receipts at refineries were 108,355,000 barrels for the month, it was reported, of which 105,186,000 barrels were domestic and 3,169,000 barrels foreign oil the 106,000 barrels daily average of the latter being 13,000 barrels above the preceding month.

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937:						
August 28	[5]3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	[5]3,455,000	307,974,000	65,620,000	116,472,000	
1938:						
March 19	3,433,550	3,080,000	306,380,000	[5]93,192,000	122,067,000	
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939:						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
May 27	3,585,250	3,405,000	278,289,000	84,152,000	26,992,000	109,386,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,726,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[9]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 18	3,835,100	[1]3,665,000	257,647,000	101,015,000	27,345,000	104,245,000
June 1	3,651,650	3,651,350	261,662,000	100,353,000	29,533,000	104,768,000
June 8, 1940	3,816,950	3,600,000	.....	99,471,000	30,609,000	104,666,000
June 8, 1939	3,376,950	[8]3,490,000	[4]277,947,000	83,157,000	28,896,000	111,603,000
Change in past year	+13.0	+3.2	—5.9	+19.6	+5.9	—6.2

[1] All time peak. [2] Peak for 1939. [3] Lowest since April, 1922. [4] Stocks, June 3, 1939. [5] Peak prior to 1939. [6] Lowest for year. [7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California. [8] June, 1939 daily average. [9] Lowest since October, 1922, due to the shutdown of six Mid-Continent States.

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (June)	State Allowable in June	BARRELS DAILY FOR WEEK ENDED June 8	June 15
TEXAS—				
Texas Panhandle	.....	.....	68,200	68,300
North Texas	.....	.....	112,100	104,900
West Central Texas	.....	.....	33,900	33,500
West Texas	.....	.....	238,200	237,800
East Central Texas	.....	.....	82,100	84,100
East Texas Field	.....	.....	396,600	397,200
South Texas	.....	.....	237,300	238,400
Texas Gulf Coast	.....	.....	227,800	236,600
Total Texas	**1,344,600**	**1,355,530***	**1,396,200**	**1,400,800**
CALIFORNIA—				
Long Beach	.....	.....	45,800	45,300
Midway-Sunset	.....	.....	64,400	56,800
Kettleman Hills	.....	.....	44,000	47,800
Wilmington	.....	.....	83,700	86,200
Others	.....	.....	386,900	401,100
Total California	**593,700**	**592,000†**	**624,800**	**637,200**
OKLAHOMA—				
Oklahoma City	.....	.....	113,950	81,900
Seminole Area	.....	.....	105,100	97,500
Others	.....	.....	218,050	227,250
Total Oklahoma	**408,600**	**408,100**	**437,100**	**406,650**
ILLINOIS—				
Salem	.....	.....	249,200	241,500
Louden	.....	.....	75,250	73,000
Other New Pools	.....	.....	123,150	146,650
Old Pools	.....	.....	10,600	9,950
Total Illinois	**395,600**	.....	**458,200**	**471,100**

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (June)	State Allowable in June	BARRELS DAILY FOR WEEK ENDED June 8	June 15
LOUISIANA—				
North Louisiana	.....	.....	69,900	69,500
South Louisiana	.....	.....	223,200	225,800
Total Louisiana	**274,700**	**278,566**	**293,100**	**295,300**
KANSAS	**159,000**	**159,000**	**150,950**	**170,650**
NEW MEXICO	**106,700**	**106,700**	**106,800**	**106,700**
EASTERN STATES—				
Pennsylvania Grade	49,400	.....	78,600	74,500
Others, Eastern	49,000	.....	19,500	19,500
Total Eastern States	**98,500**	.....	**98,100**	**94,000**
MOUNTAIN STATES—				
Wyoming	73,000	.....	71,800	73,800
Montana	18,300	.....	17,800	17,900
Colorado	4,000	.....	3,300	3,300
Total Mountain States	**95,300**	.....	**92,900**	**95,000**
MICHIGAN	**62,000**	**56,000**	**59,200**	**59,100**
ARKANSAS	**66,700**	**70,515**	**72,400**	**71,800**
INDIANA	**8,000**	.....	**12,100**	**12,700**
MISSISSIPPI	**7,000**	.....	**9,250**	**10,150**
NEBRASKA	.....	.....	**220**	**200**
‡Total 8 Prorated States	**3,016,000**	**3,006,411**	**3,140,550**	**3,148,200**
Total United States	**3,620,300**	.....	**3,811,320**	**3,831,350**

* Net daily average, considering general shutdown May 1, and 14 shutdown days in East Texas field.
† Recommendation of Central Committee of California Oil Producers.
‡ Texas, California, Oklahoma, Louisiana, Kansas, Arkansas, Michigan, New Mexico.

Crude Production Advance Halted by Drop in April

Two months of increasing crude oil production was halted in April when daily output dropped to 3,868,200 barrels from 3,873,400 barrels in March, according to the monthly report of the United States Bureau of Mines.

While the daily average dropped 5200 barrels below that for March, it remained 351,200 barrels above the figure for April, 1939, and the month's total output of 116,045,000 barrels was 10,535,000 barrels above the 105,510,000 barrels reported for April of last year, the bureau said.

Both production and exports of aviation gasoline increased over March, the former from 888,000 to 989,000 barrels and the latter from 249,000 to 302,000 barrels, but domestic demand declined from 427,000 to 209,000 barrels, resulting in an addition to stocks, which rose from 3,394,000 to 3,872,000 barrels, it was stated.

The outstanding change in the state crude production situation was a decline in Illinois from the peak of 438,100 barrels daily in March to 430,400 barrels in April. There were slight declines in production in Texas and Oklahoma, but gains in California and Louisiana practically offset losses in Kansas and New Mexico. In Louisiana it was shown, the coastal fields reached a new record output of 226,200 barrels daily.

The bureau pointed out that although daily average crude runs to stills picked up somewhat and crude production fell off slightly, imports were higher, so that the rate of accumulation of crude oil stocks showed little change; nearly 7,000,000 barrels were added to refinable stocks during the month, bringing the total to 258,066,000 barrels on April 30.

"Evidence that refiners are trying to maintain a better balance between gasoline and heating-oil yields was again indicated in April," the report commented. "The gasoline yield rose 0.8 percent, but at 43 percent was 1.8 percent below a year ago. Furthermore, the distillate yield declined only 0.5 percent, to 14.3 percent, whereas last April it was 13.4 percent.

"The domestic demand for motor fuel in April reached expectations but exports continued far below estimates," the bureau continued. "The domestic demand in April was 47,683,000 barrels, or 8 percent above a year ago; exports were 2,075,000 barrels, or 43 percent below those of last April. Not much of a dent was made in the top-heavy gasoline inventories in April, usually the first month of the seasonal withdrawal. As a matter of fact, finished gasoline stocks increased in April; stocks of unfinished gasoline declined, but this was outweighed by a gain in natural gasoline stocks. Finished gasoline stocks of 96,615,000 barrels (including 3,872,000 barrels of aviation gasoline) for April 30 were about 15,000,000 barrels higher than a year ago.

"The demand for fuel oils fell off materially on the approach of warmer weather; furthermore, the increases over April, 1939, of 11 percent for kerosene, 12 percent for distillate fuel, and 8 percent for residual fuel were comparatively modest."

Bureau of Labor Statistics figures placed the price index for petroleum products at 50.4 in April, the same as in March, compared with 51.9 in April, 1939. The crude-oil capacity represented in the report was 4,367,000 barrels, giving an operating ratio of 82 percent, compared with 81 percent in March, and 80 percent in April, 1939.

Details of new supply and demand for the month were given by the bureau in the accompanying table.

Bureau of Mines Report of Supply and Demand of All Oils

(Thousands of Barrels)

	April, 1940	March, 1940	April, 1939	January-April 1940	January-April 1939
New Supply:					
Domestic Production:					
Crude petroleum	116,045	120,075	105,510	457,928	408,243
Daily average	3,868	3,873	3,517	3,785	3,402
Natural gasoline	4,414	4,489	4,232	17,353	16,475
Benzol[1]	228	237	162	968	709
Total production	120,687	124,801	109,904	476,249	425,427
Daily average	4,023	4,026	3,663	3,936	3,545
Imports[2]:					
Crude petroleum in bond	128	.....	284	414	1,337
Crude petroleum for domestic use	3,041	2,895	2,648	9,943	6,691
Refined products in bond	[3]1,089	1,688	1,475	5,771	5,387
Refined products for domestic use	[4]1,948	3,410	366	9,410	2,161
Total new supply, all oils	126,893	132,794	114,677	501,787	441,003
Daily average	4,230	4,284	3,823	4,147	3,675
Increase in stocks, all oils	11,590	10,797	4,580	30,663	766
Demand:					
Total demand	115,303	121,997	110,097	471,124	440,237
Daily average	3,843	3,935	3,670	3,894	3,669
Exports[2]:					
Crude petroleum	4,262	4,046	6,222	15,837	20,475
Refined products	[5]7,515	7,583	9,243	27,589	35,921
Domestic Demand:					
Motor fuel	47,683	44,607	43,977	170,217	158,859
Kerosene	5,621	6,273	5,042	25,799	22,124
Gas oil and distillate fuels	12,210	16,494	10,856	69,421	56,509
Residual fuel oils	26,526	30,881	24,472	116,371	106,940
Lubricants	2,138	1,883	1,770	7,597	7,019
Wax	106	69	52	361	296
Coke	434	599	394	2,351	2,175
Asphalt	1,661	1,398	1,840	4,668	5,003
Road oil	190	111	267	501	848
Still gas	5,943	6,083	5,386	22,940	20,472
Miscellaneous	156	123	181	554	694
Losses	858	1,847	395	6,918	2,902
Total domestic demand	103,526	110,368	94,632	427,698	383,841
Daily average	3,451	3,560	3,154	3,535	3,199
Stocks:					
Crude Petroleum:					
Refinable in United States	258,066	251,120	278,565	258,066	278,565
Heavy in California	13,516	13,485	15,198	13,516	15,198
Natural gasoline	6,112	5,393	5,484	6,112	5,484
Refined products	277,739	273,845	268,565	277,739	268,565
Total, all oils	555,433	543,843	567,812	555,433	567,812
Days' supply	145	138	155	143	155

[1] From Coal Economics Division. [2] Imports of crude as reported to Bureau of Mines; all other imports and exports from Bureau of Foreign and Domestic Commerce. [3] Exclusive of 64,000 barrels imported into non-contiguous territories from outside the United States. [4] Exclusive of 43,000 barrels into territories. [5] Exclusive of 10,000 barrels exported from non-contiguous territories but inclusive of 955,000 barrels shipped from United States to territories.

Order Facilitates Runs From Marginal Wells

An order issued by the Texas Railroad Commission last week permits pipe line companies to gather "from marginal wells the full amount of the first 15 days' allowable, as set out by the proration schedule, at any time during said 15 days of the calendar month, after securing properly executed Forecast SW-2 Tenders."

About 18 months ago, the commission warned pipe line companies against accepting oil from leases in advance of the time it was scheduled for production. This resulted in carry-overs on some leases with marginal wells, especially those which had small storage facilities.

Since February, the commission has exempted from shutdowns all marginal wells. For that reason, they are permitted to transport by pipe line the full month's scheduled allowable. The new order is expected to relieve difficulties arising from the carry-over, which causes a hardship on operators of small wells.

Ten-Acre Spacing for Oklahoma's Droppleman Pool

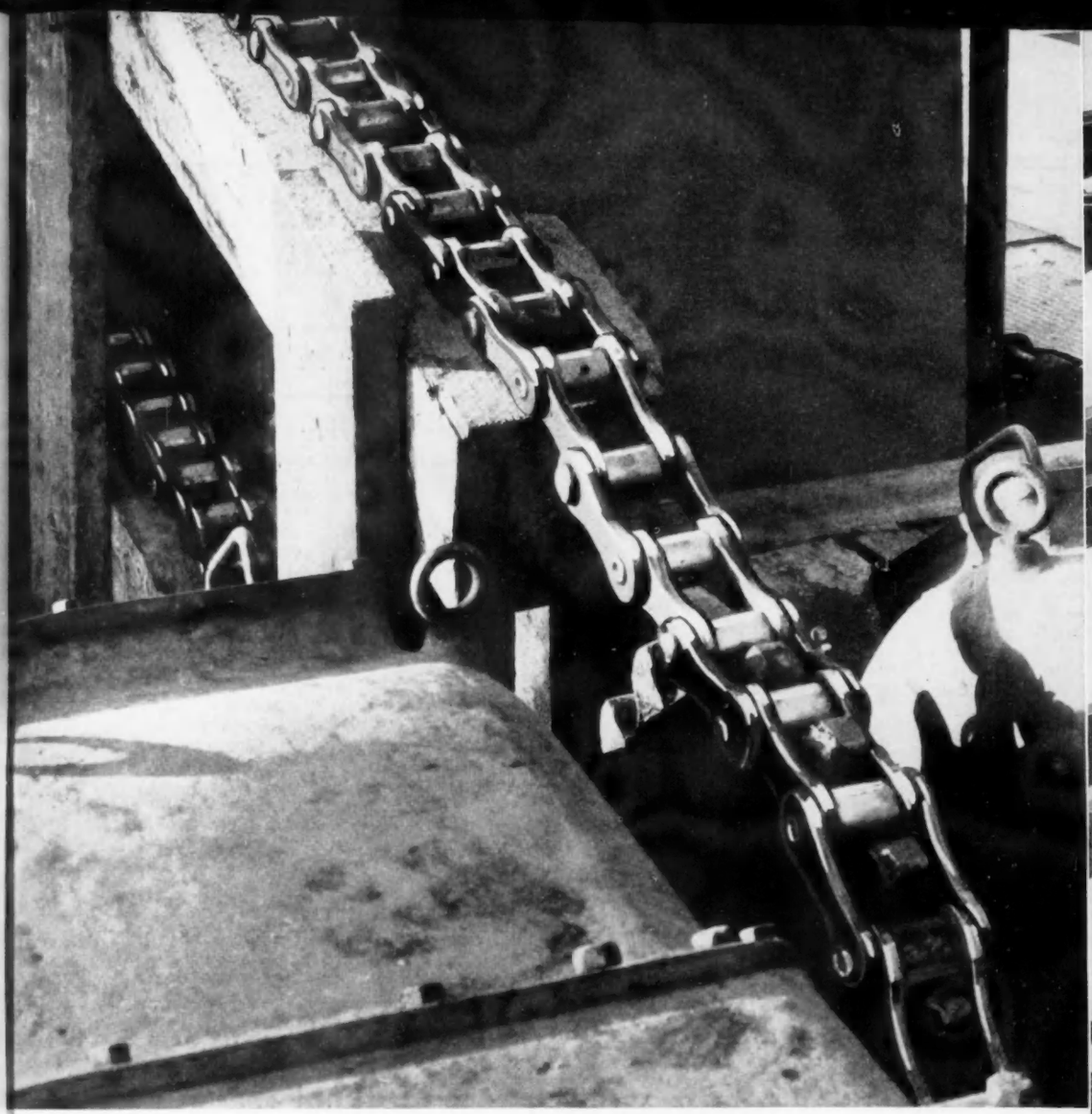
Ten-acre spacing has been ordered for the Cromwell sand in the Droppleman pool, Okfuskee and Seminole Counties, Oklahoma. This area is believed to embrace approximately 2200 acres.

Droppleman Drilling Company completed the discovery, Gaghagan 1, in NEc 3-11n-8e, Seminole County, May 6 for 175 barrels per hour initially. Pay is Cromwell sand at 3540 feet, and sand thickness is about 44 feet. Reservoir energy is gas in solution.

Texas A. & M. Offers Summer Course in Welding

A summer course in welding for persons employed in any metal-working occupation has been announced for July 1-31 by the School of Engineering, A. & M. College of Texas, College Station.

The curriculum will include demonstrations, lectures, motion pictures and practice in the use of gas and electric welding equipment. Those attending will be encouraged to specialize in some particular branch of work which is essential to national defense.



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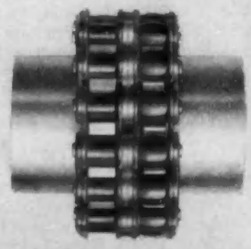

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WORLD-WIDE DEVELOPMENTS

By WM. V. GROSS, Associate Editor

Mexico

Refining Capacity Being Boosted Fifty Percent

Mexico's refining capacity soon will be increased from 117,000 to 178,000 barrels per day due to improvements and expansions underway, according to Vicente Cortes Herrera, general manager of Petroleos Mexicanos.

The company is planning to increase the capacity of the paraffin at Ciudad Madero, near Tampico, which is credited with producing half the paraffin used in Mexico, most of the rest being imported from the United States.

Report Oil Seepages in Los Mochis Area

Abundant oil seepages have been reported along the Fuerte River in the Los Mochis zone, an important sugar producing district of Sinaloa, western Mexico, and government geologists are looking over the area.

Los Mochis is on the Pacific Coast. All present commercial production in Mexico is on the Gulf Coast.

Japanese-Owned Company Said Against Unions

National Oil Workers Union of Mexico has complained to the Federation of Labor that the Japanese-owned Veracruzana Petroleum Company, which is developing considerable production in the Tampico sector for shipment to Japan, does not believe in labor unions.

The company dismissed 100 employes because they tried to form a union. Several of them, the complaint charges, were old employes of the company.

Recently, the company was credited with completion of Jopoy 8, in the Tampico sector, for between 2000 and 3000 barrels per day. Reports are it plans to increase drilling activities to boost runs to Laguna Oil Company, also financed by Japanese interests.

To Build 12-Inch Line From Poza Rica Field

Petroleos Mexicanos has announced construction plans for a 3,000,000-peso, electrically welded, 12-inch line from Poza Rica field to Alamo in the State of Veracruz, 40 miles as the crow flies. Current pipe-line right-of-way from Poza Rica to Alamo is 50 miles long.

The new line, construction of which will be under supervision of Vicente Cortes Herrera, general manager of the company, will take the place of the old line from Barra de Tuxpan and Ojite, and that between Ojite and Petrero.

Cortes Herrera is quoted as saying: "We are now planning to pump oil from Alamo to the north through the 10-inch lines that were owned by Huasteca Petroleum Company, and which pass by Tierra and Cerro Azul to Potrero. However, as a second step in this undertaking, the pipe line will be extended to Potrero, thereby eliminating operations at Alamo and Tierra Blanca, with consequent economies in the pumping system from Poza Rica north.

The announcement reads that the new line will be serviced by a pressure of 800 pounds at Poza Rica and will have a capacity of 56,000 barrels daily. It says the costs will consist of 2,060,000 pesos for material and 950,000 pesos for labor.

Mexican Oil Shipments To Italy Halted

Shipment of Mexican oil to Italy came to an abrupt halt with Italy's entrance into the European conflict. Italy has been one of Mexico's best oil customers in the past 17 months.

Jesus Silva Herzog, general manager of the export sales department of Petroleos Mexicanos, announced suspension of maritime traffic with Italy had stopped oil exports of 15,000 barrels daily.

It is estimated that Italy has taken 8,000,000 barrels of Mexican oil and products during the past 25 months, with 4,800,000 barrels of that quantity being shipped during the 12 months of 1939, and an additional 2,900,000 barrels during the first 5 months of 1940.

Canada

Western Areas See Increase In Preliminary Work

Standard Oil Company of British Columbia last week sent a geophysical party headed by W. N. Mosher, Houston, into the Southern Alberta area in the vicinity of Medicine Hat. The work, being done with gravity meter, will supplement that started two years ago by Standard Oil Company of California, parent of the British Columbia firm.

The area east of North Turner Valley, Alberta, through Calling Valley structure over to Red Deer Lake, is being surveyed for The Northwest Company.

Five geological parties connected with the mines and geology branch of the Dominion Department of Mines and Resources will work in Alberta this summer, with three parties scheduled to do surface work in British Columbia and one in Saskatchewan.

Geological and geophysical work and wildcat exploration in Western Canada is expected to gain sharply this season because of the increased need for oil in view of the European war. An increase in proven reserves and continuation of the war over a long period may bring construction of one of two proposed pipe lines—one projected to the Pacific Coast and the other to the head of the Great Lakes.

War

Italy's Entrance Into War Shifts Transportation Routes

Entrance of Italy into the European war as an ally of Germany further burdens these nations with difficulties in so far as oil is concerned. In the first place, additional quantities of oil will be consumed if the Italian forces are to be kept mobile. Secondly, the matter of obtaining petroleum supplies becomes more difficult, for it is to be expected that the British will keep both ends of the Mediterranean Sea closed (at Suez and at Gibraltar).

Italy's entrance in the war also has burdened England and France with greater difficulties in procuring oil supplies. With the Mediterranean Sea now the site of battle, it will be too hazardous to ship oil from Iran and Iraq through this direct route. Therefore, the Allies must move Iran and Iraq petroleum around Africa, or turn to South and North America as their source of supply. The Allies can procure sufficient amounts in the United States and Venezuela, and may be expected to turn to these sources.

Italy has been a large purchaser of United States oil products in recent months. No doubt she was increasing her storage, and probably supplying Germany with considerable oil. In March, 1940, Italy imported 396,000 barrels of crude oil; 14,000 barrels of natural gasoline, 52,000 barrels of residual fuels, 109,500 barrels of lubricating oils, 400,000 barrels of greases, 266,000 gallons of benzol, and 2,555,000 pounds of petroleum wax.

Although no figures are available on Italy's storage, it is generally believed to have considerable quantities. For some time, Italy has been using synthetic gasolines and fuels for domestic commercial uses.

Where Italy will be able to augment its oil supply while at war is an unanswerable question. Rumanian production cannot be increased, output continuing to decrease despite urging of Germany for additional petroleum. It is doubtful if Germany would reroute any oil it is obtaining from Rumania or Russia to Italy, as it needs all it can procure. Russia would seem the most logical spot, but the U.S.S.R. may not be willing to reduce its domestic consumption for this purpose—being not too friendly with Italy although a member of the Axis powers.

Since invasion of Ethiopia, Italy's search for domestic or colonial crude sources has been nothing short of frantic, but results have been nil, with the exception of Emilia, where an output of 15,000 tons annually would be an optimistic expectation. Italians say they have increased production in Albanian fields about 50 percent. If this is true, Italy still would represent a liability to Hitler so far as oil is concerned.

Oklahoma

Cromwell Sand Furnishes Gas Pool in Hughes County

A new Cromwell gas pool for Hughes County was brought in at Morgan-Gulf Production Company, George Deck et al's Diamond 1, CE½ NW SE 33-9n-9e, between Adams and Fuhrman oil pools. Over 1500 feet of tubing with packer was blown up the derrick as increasing gas volume prohibited running the string. High-pressure equipment was rushed to the well. The volume swelled to over 15,000,000 cubic feet, and was steadily increasing. Cromwell sand was perforated with 60 shots at 3326-50 feet. Previously, a drill-stem test at 3380-3410 feet showed 800 feet of oil, 1400 feet of salt water and a good show of gas. Hole was carried to 4261 feet in the second Wilcox, which failed to show, and a plug then set at 3350 feet. The operators have 600 acres surrounding the site. Tools are being operated by Southwestern Drilling Company, Tulsa.

Nearest production to this wildcat was Stanolind Oil & Gas Company et al's Freams 1, NWc SE 29-9n-9e, 1½ miles northwest, which initially made 140 barrels of crude daily from the Wapanucka-Cromwell horizons at 3354 feet. Two locations east and slightly north, C. J. Wrightsman drilled a duster in NEc SE 33-9n-9e, being dry in the Cromwell sand at 3301-3475 feet. The Diamond producer checked approximately 12 feet higher on the pay zone than the dry hole, although seismic information foretold about 120 feet of closure on top of the Viola lime. The area presents an excellent market for the gas, three gas companies having lines in the vicinity

Viola lime was a new producing horizon in the South Konawa pool, Seminole County. Culver & Shepherd's Burton-Swan 2, SW SE SW 3-5n-5e, acidized pay at 2825-90 feet with 1000 gallons. Hole is bottomed at 2906 feet. On a 24-hour pumping test, it was completed for 10 barrels of oil and 17 barrels of water. Other wells are productive in the Hunton lime.

Winona Oil & Gas Company extended Wilcox sand production ½ mile north in the Fish pool at Jackson 1, SW SE NE 18-7n-8e, flowing 750 barrels in 24 hours through casing and later flowing 360 barrels daily through a tubing choke. Gas gauged 537,000 cubic feet. First Wilcox sand was topped at 4189 feet, and drilled at 4195 feet. Dolomite horizon pays off in a majority of the wells.

Extend Prue at Burke

Prue sand production was extended ½ mile northeast in the Burke pool, Lincoln County. R. L. Kemp & Comail Oil Company's Meyer 1, NW SE SE 17-17n-6e, flowed 75 barrels of 44-gravity oil in 24 hours from pay 2876-86 feet. The outpost is shut in for pipe-line connection. The discovery well, Murray et al's Burke 1-A, NE SW NE 20-17n-6e, was completed in late November for 25 barrels daily. Two other outposts were staked in the county. Royalty Service Corporation has rig at Cargill 1, CNE SW 9-13n-6e, west of Laffoon pool, and Allied Materials Corporation staked Frough-Smoullina 1, NE SE NW 3-13n-6e, between Laffoon and Peck pools.

One mile north of Stroud pool, Lincoln County, Fields & Nagle's Allspaw 1, SW SE NW 35-15n-6e, shot Prue sand with 10 quarts at 3068-3171 feet. Oil rose 200 feet up the hole. Pay will be given a larger shot in an effort to get a commercial producer.

Two recent discoveries in Lincoln County, Kendrick and Perkins pools, were defined by dry holes. Summit Drilling Company et al's Griggs 1, NW NE SW 7-15n-5e, logged the Prue sand at 3520-52 feet. A shot failed to aid. This test was ⅝ mile south of the discovery. North trend of the pool will be determined at Summit Drilling Company's Cleer 2, SW NE SW 6-15n-5e, 1½ locations north of the producer, which was making hole below 1500 feet. Perkins pool was defined to the northeast as Portable Drilling Company's Bain 1, SE SW NW 23-17n-2e, perforated Hunton lime at 4503-11 feet to get 600 feet of oil and 3000 feet of salt water. Hole was plugged. Four other tests were drilling around the discovery: Malarnee Drilling Company's Cash 1, SW NE NW 24-17n-2e, was below 4200 feet; Atlantic Refining Company's Eaton 1, SE NE SW 23-17n-2e, had rotary rig, and Kint 1, NW NE SE 23-17n-2e, was completing derrick; Mid-Continent Petroleum Corporation's Kint 1, NE NW SE 23-17n-2e, was drilling below 3650 feet.

Small Extension for Billings

Billings pool, Noble County, was extended ¼ mile east at Midco Oil Corporation's Harbison 1 N,W SE SW 22-23n-2w, which flowed 341 barrels in 4 hours through tubing. Wilcox sand was penetrated at 4331-47 feet. Phillips Petroleum Company and Shell Oil Company's Hackett "A" 8, SEc 21-23n-2w, was rotating below 4295 feet, looking for the sand, and Harbison 5, SWc 23-23n-2w, was cementing surface pipe. Shell Pipe Line Company extended its line in the pool to take crude from the extension well.

A large Hunton-lime producer was completed in the Bebee pool of Pontotoc County. Hall, Troup & Moore's Haskins 1, SWc 26-5n-4e, west edge of production, flowed 789 barrels in 24 hours through perforation in lime at 2310-14 feet. Six-inch casing was set at 2479 feet and hole bottomed at 2500 feet.

Two wildcats were starting in Okfuskee County. The Texas Company's Cowan 1, SWc 5-11n-10e, 1½ miles northeast of Okemah and south of Cary pool, will be a Wilcox-sand test with Helmerich & Payne, Inc., operating the tools. J. H. Tandy, Tulsa geologist, assembled the 2100-acre block. Two miles east of the north end of the Cromwell pool, Reese Drilling Company & Ralph Dillenbeck's Berryman 1, NW SW SW 36-11n-8e, was digging cellar and pits. This location is a farmout from The Texas Company.

Wildcat Failures

Sinclair Prairie Oil Company was plugging a deep test in Western Oklahoma. German 1, SW NW NW 1-6n-13w, 6 miles southeast of Carnegie in Caddo County, drilled to 11,026 feet in Arbuckle lime and was plugged at various depths up the hole and finally quit at 2450 feet. Pontotoc conglomerate, Simpson zone and Arbuckle lime failed to show commercially.

Kerlyn Oil Company abandoned Chitwood 1, NEc SW 15-16n-4w, at 6694 feet in the second Wilcox. This wildcat was located on the anticlinal trend extending from Moore pool in Cleveland County to the Mervine pool in Kay County, being 3 miles south of Crescent pool in Logan County. Both Wilcox zones were dry. Kerlyn Oil Company et al's Cavanaugh 1, CW½ SW NW 1-15n-4w, 6 miles southeast of Crescent pool, showed salt water in the dolomitic sand in a core at 6565-71 feet.

Cities Service Oil Company et al's Sinnett 1, SEc SW 14-20n-4e, 4 miles southeast of Glencoe in Payne County, was a Wilcox-sand failure at 3970 feet.

In Tillman County, Gulf Oil Corporation abandoned Owens 1, NEc 27-4s-15w, 5 miles southwest of Grandfield and northwest of the Red River Bed pool, which had only slight staining in Arbuckle lime at 4025-4232 feet. In the Komalty sector of Kiowa County, Carl Carter's Hinton 1, SEc 1-17n-17w, was dry at 2764 feet and abandoned. This area was extended west as Fields & Nable's Oster 6, SWc 27-7n-17w, flowed 44 barrels in 21 hours. Pay is lime at 990 feet, acid treated. This is one of the best shows in 15 years of drilling in this shallow area.

Extend West Francis

L. P. Sandback et al's Statler 1, NEc 26-5n-6e, on the west edge of West Francis pool, Pontotoc County, extended production after showing 4,500,000 cubic feet of gas and flowing 40 barrels of crude in 24 hours. Pay is sand at 1884-1903 feet with 7-inch pipe cemented at 1859 feet. Gas was increasing, estimated at about 7,000,000 cubic feet after deepening.

West and north offsets were staked to the recent Cromwell sand strike, C. A. Yoakam's Replogle-Johnston 1, 4 miles east of Okemah in Okfuskee County. Phillips Petroleum Company moved in derrick at Mahon 1, NEc NW 11-11n-10e, a west offset, and C. A. Yoakam staked Replogle-Johnston 2, SWc SE 2-11n-10e, a north offset.

Troup Moore & Dennis cored saturation in sand at 1633-40 feet at Bowie 1, NW NE SE 3-4n-3e, south of Byars pool in Garvin County. It was deepening. The test is checking about 100 feet higher than the old Charles F. Carter

producer in Section 8-4n-3e, which was exhausted.

The fifth start in the Cumberland pool, Marshall County, was underway at Pure Oil Company's Crissman 1, NEc 29-5s-7e, northwest of the discovery well. It is a cable-tool test.

Forest City Basin

Saturated Cores Indicate Third Well for Falls City Pool

Third producer in the Falls City pool of Richardson County, Nebraska, was indicated as Harry Harper's Sibbernsen 1, SE NE NW 20-1n-16e, cemented 7-inch pipe on top Hunton lime at 2210 feet, with hole bottomed at 2225 feet. Cores showed saturation. The test ran on par with Pawnee Royalty Company's Bucholz well, ¾ mile to the northwest, which is averaging 250 barrels of crude daily. Operators were changing from rotary to cable tools to drill in the third producer.

The discovery well, Pawnee Royalty Company's Boice 1, CSL N½ NE NE 18-1n-16e, tested 50 barrels of oil and 100 barrels of water at 2286 feet in the Hunton lime. On initial tests, the well made 100 barrels daily but water increased to ruin the show and it was deepened to 3332 feet in the Arbuckle lime. This failed to show. Operators then retested the original pay zone.

Initial commercial production in the Kansas sector of the basin was confirmed at McLaughlin et al's McLeod 1, C NW SW 4-10s-20e, near McLouth in Jefferson County, which pumped 35 barrels of 21.6-gravity oil in 24 hours from acidized Mississippi lime at 1469-1596 feet. The test missed the gas pay in the Bartlesville sand, which was picked up ½ mile southwest in another test.

C. L. Carlock et al moved a rig to the Holt lease in C SW SW 35-2n-16e, a mile north of Falls City with drilling to start immediately.

In the Missouri sector, Tedlock & Kilby staked Browning 1, SWc 22-62n-39w, Holt County. Three miles west of Princeton, Mercer County, George Moore et al's Moss 1, NW SW SE 30-65n-24w, was an Arbuckle lime failure. Viola lime was topped at 1725 feet, St. Peter (Wilcox) at 1937 feet, and Arbuckle lime at 2015 feet. At 2115 feet in the lime, the hole filled with water. Operators were deepening.

In Nemaha County, Nebraska, Sonken-Galamba et al's Ord 1, C NW NW 8-5n-14e, spudded in.

Roach-Vincent et al's Dillingham 1, C N½ NE SW 16-53n-34w, Platte County, Missouri, topped Hunton lime at 1484 feet, drilled 2 feet, and suspended operations. Brin & Nathan's Decker 1, C NW NW 1-61n-38w, Holt County, shut down at 1685 feet.

Uhri Oil Corporation's Ogle 1-A, NW SE SE 9-1n-14e, Richardson County, Nebraska, shut down as 8-inch casing collapsed at 2040 feet.

Kansas

Three Pools Opened by Small Wells; Others Extended

Three pool-openers were completed last week. Gulf Oil Corporation and Gled Oil Company's Sander 1, CN½ SW SE 30-13-16w, 2½ miles northeast of the Toulon pool, Ellis County, established a potential of 312 barrels daily after acid in Arbuckle lime at 3450-58 feet. The state Conservation Commission reports this as the seventeenth oil strike for 1940, and named the area Sander pool.

Bitikofer (Chat) pool, McPherson County, was opened as Aladdin Petroleum Company and Saco Oil & Gas Company's Bitikofer 1, CN½ NE NW 1-20-1w, east of Ritz-Canton pool, was completed for 49 barrels of 29-gravity oil in 24 hours from pay at 2911 feet, drilled to 2916 feet. It was treated with 4300 gallons. Gas gauged 3,500,000 cubic feet.

Three miles west of Arkansas City gas pool and east of Geuda Springs pool, Cowley County, W. M. McKnab opened the Snyder pool in CW½ NW NW 15-34-3e, with a wildcat that established a 24 hour swabbing potential of 309 barrels from Bartlesville sand at 3270-90 feet.

Rex & Morris extended Brant pool, Butler County, ½-mile west at Greenley 1, NEc SE 16-28-7e. After acid, it was completed for 35 barrels daily on the pump from Mississippi lime at 2655-72 feet. A ¼-mile east extension was given the Wilkens pool, Ellsworth County, when Duwe & Farris' Wilkens 1, CSL SE NE 13-17-10w, swabbed 72 barrels in 24 hours from Arbuckle lime drilled to 3263 feet.

Dutt Pool Abandoned

Cities Service Oil Company abandoned Dutt pool in Russell County. Dutt 1, NWc SE 18-13-14w, north of North Atherton pool, was completed for 241 barrels of 24-gravity oil in May, 1939. Crude, of poor quality was being trucked out.

Three miles west of Stoltenberg pool, Russell Moore abandoned Lille 1, CS½ SE NE 30-16-10w. Hole filled with water from Arbuckle lime at 3402-06 feet.

Two dry holes were reported west of Welch pool, Rice County. Clyde Pulse et al's Baker 1, CSL SW SW 33-20-6w, ¾-mile west of production, was abandoned at 3431 feet. Same operators' Wahlford 1, SWc 33-20-6w, 2 miles west of the pool, had Chat at 3425-27 feet but was a failure at 3508 feet.

Cities Service Oil Company's Hansen 1, SEc NW 15-6-19w, west of Faubin pool, Rooks County, failed to show in Arbuckle lime at 3635-3700 feet and was plugged.

Bay Petroleum Company et al's Coons 1, CW½ SW SW 13-19-1w, northeast of Ritz-Canton pool and 3 miles north of Bitikofer pool, McPherson County, may open a new Mississippi Chat pool. Mississippi lime was topped at 2896 feet. Chat at 2906 feet and a fully saturated dolomitic core recovered at 2922-24 feet. Standard tools were rigged up to drill in and test.

West of North Bornholdt pool, Rice County, C. L. Carlock et al's Conrad 1, CW½ SW NE 15-20-6w, was abandoned at 3385 feet. Mississippi Chat at 3308-14 feet showed some saturation, and a show of black oil was recovered at 3310½-14 feet.

In northeastern Kansas, Kerlyn Oil Company abandoned Wise 1, C SE SW 28-12-20e, east of Lawrence in Douglas County, at 1588 feet in Mississippi lime, topped at 1185 feet. Davis Gas Corporation located Julien 1, SWc NW 9-11-19e, Jefferson County.

Two Barton County Tests Dry

Two Barton County wildcats were failures. Champlin Refining Company's Fiege 1, CE½ SE NE 22-20-11w, south of Silica pool, showed nothing in Arbuckle lime at 3403-15 feet. W. N. Bartlett and Crum's Hulme 1, CE½ SE SW 9-20-12w, approximately 3 miles west of Ellinwood pool, had dry Arbuckle lime at 3435-45 feet.

Northeast of Reynolds-Shaffer pool 2½ miles, Butler County, Ralph Wixson et al's Bolin 3, SE SW NE 1-27-6e, filled with water at 3092-96 feet in the Simpson sand, topped at 3072 feet. Hole was bottomed at 3105 feet. Jocelyn, Murfin et al located Hall 1, SEc SW 7-29-7e, southeast of Snowden-McSweeney pool, Butler County.

Two new wildcat starts were staked in Barton County. Finston & Company had a rotary rig at Pichner 1, CEL NE SW 24-16-11w, 3 miles east of Prusa pool. Jack Robertson et al moved in materials at Miller 1, CWL SW NE 4-16-14w, east of Trapp pool. In Russell County, Pryor & Lockhart et al's Davidson 1, CE½ NE NW 12-15-11w, 10 miles east of Greenvale pool, was drilling below 1500 feet.

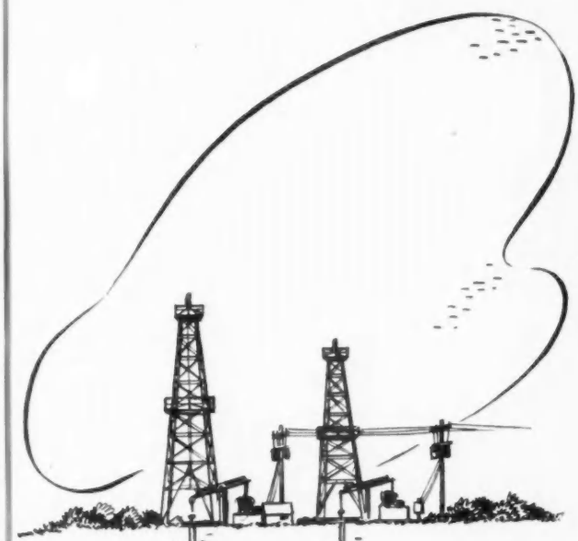
Five miles west of Bloomer pool, Barton County, C. L. Carlock et al's Jenke 1, CW½ NW NW 7-18-11w, logged dry Arbuckle lime at 3417-60 feet and was abandoned. J. H. Wagoner et al's Ramsey 1A, SW NW SE 8-24-5e, east edge of Hazlett pool, Butler County, pumped 20 barrels of oil daily after acidizing Kansas City lime with 500 gallons. Pay, topped at 2088 feet, was drilled to 2096 feet.

Westgate-Greenland Oil Company staked Lassen 1, CS½ NW SE 24-17-2w, ¾-mile southwest of Roxbury pool, McPherson County. North of Otis pool, Rush County, Crawford et al had a rotary rig at Schlegel 1, SEc NE 34-17-16w. Skelly Oil Company located Harbacek 1, CE½ NE NE 7-16-10w, a south offset to Aylward Producing Company et al's Haska strike which was completed for a maximum well, 3000 barrels, to extend production in the Stoltenberg pool, Ellsworth County, a mile west.

C. L. Carlock extended Cress pool, Ellis County, ¼-mile when Thurston 1, CWL NE SW 18-11-16w, established a potential of 3000 barrels daily from Arbuckle lime at 3347 feet.

Stanolind Oil & Gas Company's Judd 1, CSE SE 15-21-38w, fartherest west test now drilling in Kansas, is below 3000 feet with all formational data withheld. It is northwest of Lakin, Kearney County, and west of production in the Nunn pool, Finney County.

Foster Oil Company's Howard 2-A, CE½ SW SW 8-34-4e, on the east edge of the Arkansas City gas pool, was drilling at 3615 feet in Mississippi lime with nothing showing. Several oil shows were encountered in the Layton zone as well as a water fill-up at 2635-50 feet.



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Illinois

Trenton Added to Centralia Field's Producing Horizons

Trenton lime production in the Centralia field, Clinton County, was assured when Ames-Hicks' Brown 1, Lot 10, Block 5, Second Home Terrace addition, city of Centralia, swabbed and flowed between 8 and 9 barrels of oil an hour from 4067 feet after two acid treatments of 2000 and 1500 gallons. The test was being swabbed and in all probability will be put on the pump.

Meanwhile, production of the pool, being boosted daily by big Devonian-lime completions in the northwest area, was averaging about 65,000 barrels a day. Eight months ago, when Devonian production was first uncovered, the field was making 5000 barrels a day from shallow wells.

Featuring the pool's completions was Shell Oil Company's E. C. Criley 11-C, W½ NW NW 35-2n-1w, which flowed 6115 barrels in 13¼ hours or at the rate of 11,064 barrels a day. The producer was bottomed at 2894 feet.

Probably the greatest sustained production ever made by an Illinois well was accorded Gulf's Community Buehler 1, Section 1-1n-1w, Centralia field, which in 23 days had a cumulative production of 119,367 barrels, according to company officials, an average of 5425 barrels a day. It was initialed at 3710 barrels in 9 hours from Devonian lime.

Two Washington County wildcats, Gulf Oil Corporation's Buhl 1, NW SE SW 23-1n-1w, a mile south of Irvington, was to run a drill-stem test to 1538 feet in Benoist sand where saturation was encountered. The test also recovered a show of live oil in the Cypress at about 1422 feet. Ohio Oil Company's Buchner 1, NE NW 9-2s-2w, was drilling below 2322 feet, and thus far had encountered no shows.

Test McClosky in Jasper Wildcat

In Jasper County, Pure Oil Company was preparing to test the McClosky at Redmon 1, wildcat in E½ NW NW 16-5n-10e, which drilled through the Devonian to 4584 feet. Casing was cemented at 2760 feet. Only stains were found in the Devonian. The test is a mile east of the company's Mattie Aldridge 1, another wildcat, which a week ago was initialed at 1422 barrels natural from the McClosky to open a new field.

In Edwards County, Superior Oil Company's C. Green 1, NW NW SW 19-2s-11e, near the Albion pool, was drilling below 4400 feet for the first test of the Devonian lime in the area. West and north of Grayville, Superior Oil Company's Scott 1, SE SE NE 36-2s-10e, also headed for the Devonian, was below 3570 feet.

A decision to drill a Trenton-lime test in the Lake Centralia-Salem field of Marion County, most prolific of the state's productive areas, has been made by Paul Rossi, Salem operator. He plans to begin the venture by the latter part of the month on the Brooks lease in Section 29-2n-2e. Present deepest productive level is the Devonian lime at 3250-3500 feet. Trenton is expected at 4350-4400 feet. An east outpost, a mile from the field's production, Joe Miller et al's Foster 1, NW SW SW 11-1n-2e, was cementing casing at 3658 feet to shut out water preparatory to cable-tooling ahead in the Devonian formation. A west Devonian outpost, Frazier Robert's Phillips 1, NW 7-1n-2e, was shut down for orders at 3558 feet. The site is a Shell Oil Company farmout.

A new Coles County wildcat, Carter Oil Company's J. E. Cobb 1, C SW SE 10-13n-7e, 6 miles north of Mattoon, was drilling at 1559 feet. Two miles south of Mattoon, the company has moved in cable tools to clean out J. H. Seaman 1-A, a discovery which quit flowing after an initial test of 170 barrels in 17 hours from the McClosky. If the flow is not revived, pumping equipment will be installed.

The State Geological Survey, in its monthly report, said Illinois' production for the first five months of the year was about 63,266,000 barrels, approximately two-thirds of the entire 1939 output. Producing wells in new fields numbered 6328 on June 4, and are located in 61 fields, all discovered since January 1, 1937. At the beginning of the month there were 552 operations underway. Of the 342 successful completions during the 30-day period, 129 were in Marion County, 71 in Clinton County and 60 in Fayette County.

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West Texas

Duggan Northeast Extension Flows 18 Barrels Oil Hourly

Half-mile northeast extension was given the Duggan field, Cochran County, when Magnolia Petroleum Company's Mallet Land & Cattle Company 1, NWc Labor 15, League 50, flowed 18 barrels of 32-gravity oil hourly after using 5500 gallons of acid in pay at 4996-5038 feet. It is scheduled to be reacidized with 6000 gallons. The elevation is 3655 feet. The company has moved rig 1¼ miles east by south into Hockley County to drill Mallet 1-B, center Labor 13, League 50, being on a strike towards the Slaughter field. The new project is near the center of a large lease block held by the company, which proposes to carry on continuous development, and possibly install a gathering system. The oil can be routed through The Texas-New Mexico Pipe Line Company's authorized 8-inch trunk line to Midland, where deliveries would be made to Magnolia Pipe Line Company's system.

Ray Albaugh et al's Robinson 2, northwestern Dawson County wildcat, encountered sulphur water at 4983-91 feet with an elevation of 3118 feet, and was drilling at 5080 feet. Nearby lease owners contributed towards the deepening of the test to 5250 feet.

An extension for the north portion of the Wasson field is to be sought by Don Danvers et al's Willard 1, SEc Section 739. Drilling obligation was assumed several months ago in acquiring the section for an over-riding royalty. Plymouth Oil Company and Amerada Petroleum Corporation's Brownfield 1, wildcat in eastern Yoakum County, was drilling at 2450 feet.

Gulf Oil Corporation's University 2-N, SE NW SE Section 9, Block 35, Ector County, developed prolific production in the southeast portion of the Jordan field. Natural flow of 358 barrels of 34-gravity oil in 2 hours was made from porous lime at 3545-46 feet. This pay zone continued to 3568 feet, followed by hard lime to 3575 feet, where the well flowed 970 barrels of oil in 7 hours with 220 pounds back pressure on casing.

Third oil strike for western Crockett County this year is in prospect as result of the preliminary showing made by Moore Exploration Company's Hoover 1, C NE SW GC&SF Section 16, Block 1, 5 miles northeast of a recent discovery by the company. Hoover 1 logged nominal oil saturation at intervals below 1920 feet, and was drilling with tools at 2140 feet. Rotary was replaced by a machine at 2100 feet after cementing 5½-inch pipe at 1984 feet. This wildcat logged top of solid lime at 1910 feet with an elevation of 2445 feet. The company's joint operation with Olson Drilling Company on the Noelke ranch, C NW SE HE&WT Section 10, Block GG, established a new pool in pumping 130 barrels of 27.4-gravity oil initial after acidizing broken pay section at 2153-2371 feet. The well averaged 4 barrels hourly towards the end of the official test. The latter logged top of Yates at 1225 feet and solid lime at 2085 feet, with an elevation of 2720 feet.

Lewis, Shannon and Graham's Noelke 1, east offset to the Soma pool discovery, flowed 72 barrels of 34-gravity oil natural on 24-hour gauge after installing tubing packer. Production is from Yates sand at 1064-1100 feet. The prolific gas yield encountered from this zone by the discovery apparently is due to a crevice. Mudge Oil Company's Noelke 1, north outpost and only remaining active test, has been delayed for several weeks by a fishing job at 460 feet. Moore Exploration Company et al's Noelke-State 1, located 857 feet from north and 830 feet from most easterly west line of Section 55, will try for a ⅝-mile south extension to the Soma pool. Development of these shallow areas will be restricted until pipe line facilities become available. M. & M. Drilling Company's Bouscaren 1, a mile north of the Soma discovery, is credited with having missed the oil and gas zone in the Yates, and was drilling at 1200 feet.

Helmerich & Payne and Atlantic Refining Company's University 1, southwestern Andrews County wildcat strike, was awaiting nitro shot in broken pay at 4260-4425 feet. Swabbing test after using 14,000 gallons of acid averaged 7 to 10 barrels of 36-gravity oil hourly. A producer is needed to perpetuate lease until additional development can determine if profitable production is present. Atlantic Refining Company's University 1-2, north offset, was drilling at 3320 feet, having logged top of anhydrite at 1480 feet, and the company's University 1-23, 2 miles south of the producer, was drilling at 2630 feet. Both require production early in July.

Gulf Oil Corporation's W. N. Waddell 31, Crane County semi-wildcat and between the Dune and Gulf-Waddell fields, failed to increase its oil yield in drilling to 3916 feet. On swabbing test the well averages 17 barrels of oil daily from pay topped at 3312 feet with an elevation of 2708 feet. It will be carried to the water table before plugging back for nitro shot.

The Texas Company's University 3-E, west edge location for the Wickett sector, Ward County, gauged 204 barrels of oil, plus 2½ percent water, on 3-hour proration test through tubing after 140-quart nitro shot at 2646-82 feet. It was drilled to water at 2700 feet, then plugged back to 2692 feet. Gulf Oil Corporation's Wristen 5, Ordovocian test for the Shipley area, was drilling lime at 7725 feet. Sinclair Prairie Oil Company has contracted to drill a 3100-foot wildcat in southeastern Ward County in acquiring lease on the Wirt Davis tract. Location has been tentatively assigned to north corner of W¼ H&TC Section 32, Block 4. The company recently paid a cash bonus of $7.50 to $10 per acre for additional protection in the area.

North Texas

Wilbarger County Wildcat Promises Area Depth Record

Production depth record for North Texas and expansion of the district to the northwest appeared to be in the making late last week when preliminary test was given a wildcat in northwestern Wilbarger County. Rated as one of the most important of the numerous deep exploratory tests underway, Amerada Petroleum Corporation's B. Goodpasture 1, CSW SW H&TC Section 35, Block 15, 12 miles northwest of Vernon, swabbed and flowed 15 barrels of 41-gravity sweet oil per hour. Production is from saturation at 6306-33 feet in Ellenburger, topped at 6288 feet, with 5½-inch pipe cemented at 6306 feet. Top of Simpson was called at 6160 feet. The well was deepened following the initial test to 6338 feet, logging hard lime the last 5 feet, and may be carried to the water level so as to determine the thickness of the Ellenburger. This strike displaces the Ringgold pool, Montague County, as the deepest producing area for the district by a 600-foot margin. The Frederick pool, Tillman County, Oklahoma, situated 8 miles east, is the nearest production, and also produces from the Ordovician.

Three oil-producing horizons from the Canyon and Strawn series indicated commercial production in drilling this Wilbarger County wildcat to the Ordovican in accordance with lease contract. Regardless of the performance of the well from the deep zone, it is scheduled to be plugged back to one of the shallower horizons for final completion for economic reasons. The company holds lease on about 5000 acres in the area, and anticipates considerable offset drilling due to the presence of multiple oil levels. F. A. Lain et al's Coffee 1, C NE NW H&TC Section 44, situated 2½ miles southeast of Goodpasture 1, is the only deep test in the general area, and the hole was junked at 6212 feet in June, 1937. O. M. Stidham & Sons' Watts 1, C NE SW H&TC Section 64, Block 15, seeking a northeast extension, was drilling near the 2000-foot level.

First oil saturation encountered by Amerada Petroleum Corporation's test was logged at 3230-52 feet in Canyon. No test was made. An oil sand at 3963-75 feet flowed oil and gas when tester was used at 3963-95 feet. A sand at 4214-23 feet showed little oil with mud, and 36-gravity oil was recovered in using tester on Strawn saturation at 4407-22 feet.

An extension for the sparsely explored deep pay in the Sigler pool, Wilbarger County, was recorded by Davis Oil Corporation's Waggoner-McDaniel 1-A, NEc H&TC Section 36, Block 2, with a steady oil flow indicated after brief tests. Completion gauge is pending. Production is from perforations made in casing opposite saturation at 3563-77 feet, with the hole bottomed in shale at 3660 feet. The well originally was completed October, 1929, as a pumper at 2687 feet.

Third oil producer for the Ringgold pool became assured when Fain-McGaha Oil Corporation's Spring 1, west offset to the discovery, cored oil sand and conglomerate at 5668-74 feet, having entered the Bend section at 5651 feet, or 2 feet higher structurally than

the pool opener. The oil zone was likewise found higher in the section. Spring 1 will be cored to main conglomerate body before running pipe for completion. Gulf Oil Corporation's Worsham 1, south offset, was drilling at 1150 feet. W. B. Omohundro et al made location for Seay 2 on their discovery tract, serving as a south offset to British-American Oil Producing Company's north outpost producer. The latter also has authorized another test.

Sinclair Prairie Oil Company's Milam 1, 3½ miles northeast of the Ringgold production, cemented 7-inch pipe on bottom at 5683 feet after logging broken oil pay in conglomerate and sand at 5666 feet. Top of Bend, placed at 5590 feet, makes this wildcat about level sub sea with the producers. The well bailed 1 barrel oil the first hour after perforating with 45 shots at 5620-5628 feet, and additional perforations were to be made opposite more favorable saturation topped at 5676 feet. Harvey Drilling Company and Sinclair Prairie Oil Company's Threadgill 1, western Montague County wildcat, was drilling shale at 5940 feet. Walter Gant et al's Will Laird 1, southwest corner of the county, was drilling at 1800 feet.

Development of the Bonita 4-well pool, eastern Montague County, increased to 6 operations through Sinclair Prairie Oil Company having moved in materials for Langford 1 and Doty 2, west and south offsets, respectively, to Doty 1. Initial tests for the Admire, Gilbert and Lee tracts have rigged up, while Magnolia Petroleum Company's Gilbert 2 is starting up. Two townsite locations by T. C. Rose and F. K. Williford have not progressed beyond the paper stage.

Sinclair Prairie Oil Company's Benton 1, ¾-mile east of Nocona townsite and 1¾ miles east by north of nearest production, was coring at 5395 feet after making a disappointing performance from the Bend, topped at 5056 feet, with top of conglomerate recorded at 5127 feet. Formation tester used at 5122-80 feet yielded 350 feet of oil cut mud, plus 400 feet of mud and 1200 feet of salt water. Other drill-stem tests produced water. Top of Simpson is tentatively placed at 5178 feet. It will be carried to Ellenburger. Stanolind Oil & Gas Company's Davis 3, northwest outpost for the Nocona deep pool, logged comparatively thin oil saturation at intervals in the Bend, topped at 5205 feet, and in Ellenburger, entered at 5352 feet. Drill-stem tests made at intervals showed small volume of oil-cut mud. It was coring hard lime at 5850 feet, and is due to be plugged back to try for a completion in the 4600-foot Strawn. The same company's Hill 1, east offset to the most westerly producer, was coring at 4720 feet after yielding oil-cut mud at 4572-96 feet and 4657-75 feet. Sunray Oil Company et al's Stambough 1, south of a failure on the southwest edge of the pool, earned a potential of 1624 barrels after using 2000 gallons of acid through perforations at 5195-5203 feet.

K-M-A Ellenburger Well Pumping

Magnolia Petroleum Company's Thom 3, second Ellenburger oil completion for the K-M-A field, pumped 55 barrels of oil and 58 barrels of water on last daily gauge. It was drilled to 4427 feet, with about 4 feet of saturation that would not take acid. Consolidated Oil Company's Barnes 1-K, situated between K-M-A and Consolidated fields, failed to respond to nitro shot at 4395 feet in Ellenburger, topped at 4334 feet, and was drilling at 4405 feet. S. H. Fagadau et al's Barnes 1-C, mile south of the latter, encountered Ellenburger at 4383 feet, and halted at 4399 feet to make a production test.

Nominal oil saturation passed up in the upper Strawn by tests in the Walnut Bend field, Cooke County, registered commercial production for a southwest outpost that had failed to make a producer from the Ramsey and Best sands in the basal Strawn and also the Simpson. The fourth oil zone was revealed when Sinclair Prairie Oil Company's Hudspeth 1, swabbed 23 barrels of fluid hourly, averaging 90 percent live green oil, after perforating casing with 50 shots at 4108-22 feet. The Best, named after discovery lease, or main oil zone, was topped at 4987 feet, but proved dry. Formation thickened below this marker, with top of Simpson at 5460 feet, and Ellenburger at 5938-6110 feet. These 2 Ordovician sections carried no saturation. The new oil level may enable the field to spread along the southwest rim of the high just as the Ramsey 4700-4800-foot sand provides productive area on the southeast flank although the Best sand is barren.

Production test was underway late last week for Continental Oil Company et al's O. O. Ross 1, southwest

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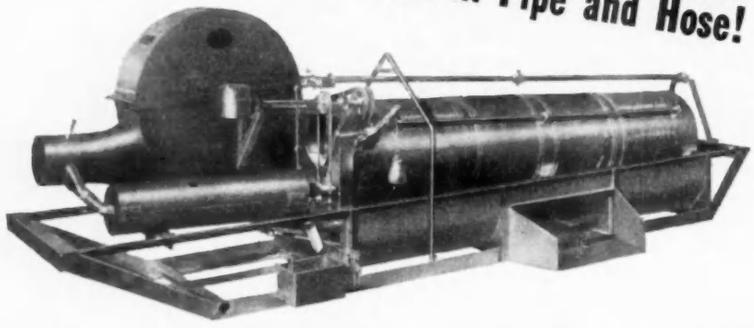

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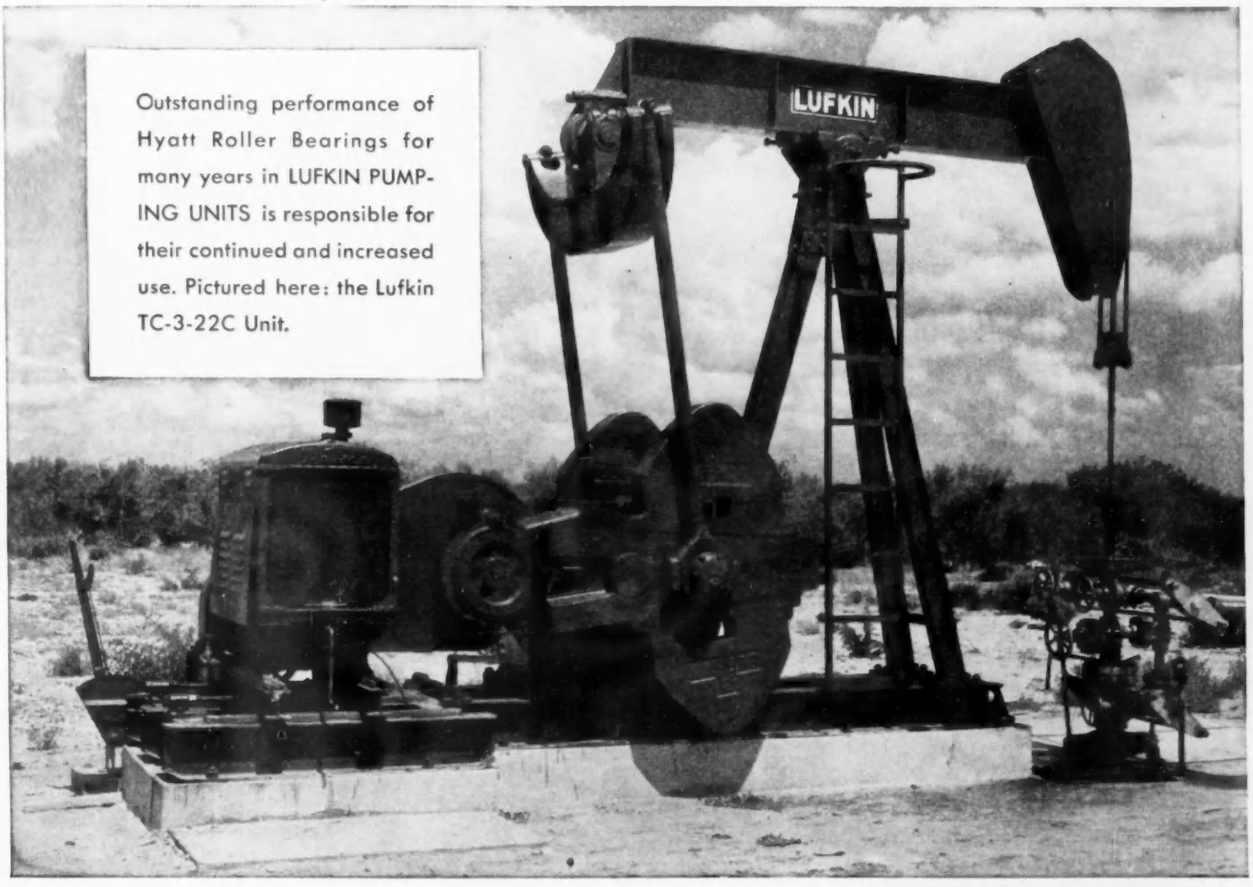

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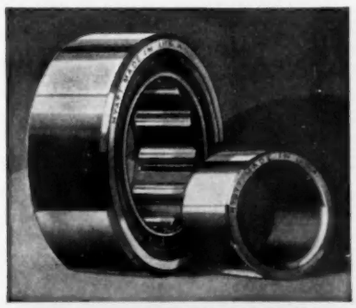

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QUIET

offset to the partnership's Bend discovery in the Jolly pool, western Clay County, after coring oil saturation at 5383-87 feet. Six-inch pipe was cemented at 5380 feet. This prospective third producer for the area encountered top of Bend at 5382 feet, or 10 feet low to the discovery. However, this differential was almost eliminated through the logging of pay higher in the section. Owners of acreage adjacent to the unitized block have not made plans to participate in the development. The unit group propose to skid rig one location east for their next test. Wildcat operations in Clay County were uneventful. L. T. Burns et al's Watson 1, near south line of county, was drilling at 4990 feet on a 5200-foot depth contract. No shows were recorded in the Canyon or Strawn. Wirt Franklin and W. B. Omohundro's Staggs 1, 3½ miles south of Petrolia shallow production, was drilling at 5780 feet, having entered the Bend at 4840 feet. E. C. Norwood et al's Hapgood 1 was drilling at 4210 feet.

Denton County's latest participation in deep explorations involves Seitz, Comegys & Seitz, Inc.'s Fred Freeman 1, 1½ miles south of Krum, and was drilling at 3780 feet. This wildcat originally was carried to 3507 feet in May, 1933, by Freeman Brothers et al and the new owners of the drilling block sold lease spreads at $12.50 per acre on a 6000-foot depth contract.

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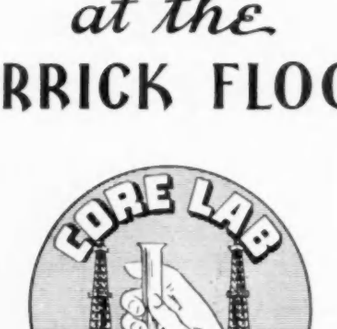

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Texas Panhandle

Sherman County Wildcat Is Trying for Deep Oil

A series of acid treatments are being given Indian Territory Illuminating Oil Company's Bryant 1-A, Sherman County wildcat, to try and develop oil production from saturated lime found below the known producing levels in the Texas Panhandle in fulfilling an Ordovician test contract. Seven-inch casing cemented at 4084 feet was perforated at 3975-88 feet. The formation failed to respond to the first acid treatment and an additiional 1500 gallons was used the past week. This wildcat is credited with having logged 100 feet of Simpson with 75 feet of Ellenburger overlying granite at 5125-38 feet. Pipe was set after plugging back.

Canadian River Gas Company's Amarillo 1, Potter County wildcat, has been plugged at 5018 feet. Show of gas and high-gravity oil near the 3800-foot level did not prove commercial when the hole was plugged back and tested.

East Texas

Completion of Camp County Test Indefinitely Delayed

Removal of rig from Harry S. Moss and Delta Drilling Company's Venters 1, Camp County wildcat that has been idle since early March after coring oil saturation in the Lower Trinity series between 7947-8087 feet, points to further delay in completing the well. Oil saturation carried by recovered cores and confirmed by electrical log precipitated a major lease and royalty play in the general area. Owners elected to defer completion until lease titles are cured. Protection string of 5½-inch pipe was cemented at 8085 feet. Prior to moving off the heavy rig the hole was washed clean of drilling fluid. A small outfit will be set up to drill plugs and swab the hole when the staff of lawyers engaged in curing titles give the all clear signal.

Delta Drilling Company will use the rig in drilling Shell Oil Company's Hall 1, projected 6700-foot Trinity test for the Maud area, Bowie County. The latter has a large lease block centering on the John Downey Survey, 3½ miles northwest of Maud. Deep oil prospects in the county have been enhanced by the recent discovery of Paluxy production to the east in Arkansas.

Sun Oil Company's Everhart 1, Chapel Hill pool, Smith County, logged top of Travis Peak at 8365 feet, and was drilling at 8385 feet. The Lower Glenrose and Pettit zones, sources of gas-distillate and oil, respectively, elsewhere in the area, did not indicate commercial production when drill-stem tests were made at intervals. The company's Sanders 1, south outpost, logged top of anhydrite stringer at 6540 feet with an elevation of 460 feet and was drilling at 6900 feet. A third test has been authorized by the company, involving J. C. Joesn 1, L. H. Dillars Survey No. 110, 1¼ miles southeast of the discovery.

Plymouth Field Hearing

Special operating rules for the Cryer sand in the Plymouth field, San Patricio County, will be considered at a hearing scheduled by the Texas Railroad Commission for June 20.

Southwest Texas

LaSalle County Wildcat Cores Additional Wilcox-Sand Shows

South Texas' newest Wilcox trend was gaining much interest as H. R. Cullen et al's J. L Washburn 1, Section 88 and 8 miles southwest of Fowlerton, LaSalle County, cored more Wilcox sands. The latest was a 15-foot zone topped at 5415 feet which developed 100 feet of 40.3-gravity live oil, 160 feet of mud and fresh water and developed 10 pounds pressure in 25 minutes. The hole was being deepened below 6025 feet.

This wildcat had topped the Wilcox at 3612 feet. Between 4740-4829 feet, it showed for a gas producer, but was carried deeper. The well now is believed to be in the base of the Wilcox formation. This operator is planning a series of tests in the general area. Newest is B. Wildenthal, Jr., western portion of the Cotulla townsite. It is reported that this hole may be carried to 12,000 feet, which likely would be the Edwards lime.

W. C. McGlothins' H. N. Bell 1-A, Black Survey, Bastrop County and 2 miles west of Sayersville, was swabbing some oil from the lime at 3152½ feet. The test topped the formation at 3135 feet, and at 3149 feet after an acid treatment, swabbed a little oil and sulphur water. It was deepened, and the test showed no increase. Standing 12 hours, the fluid column rose 1000 feet from bottom. It may pump 50 barrels per day.

Wilcox Oil & Gas Company acidized Gilliam 6, attempting to established Edwards production in northeastern Zavala County. The test is at 3922 feet, or 4 feet in the Edwards limestone, where it showed a little oil and water. After the treatment, water broke in and the hole was recemented.

Less than a mile west of Radado field, one of Jim Hogg County's oldest areas, Walter Achning and Charles Daubert's Wood et al 1, Block 11, Section 82, was completed for 117 barrels of 28-gravity oil per day through ¼-inch choke under 286 pounds tubing and 450 pounds casing pressures, with a gas/oil ratio of 700 to 1. The well, opener of the Manila field, was drilled under contract by Kirkwood & Morgan. With an elevation of 621 feet, it cored Pettus sand at 2603-13 feet

Sun Oil Company established the East Fitzsimmons pool, Duval County, with Mauro Garcia 1, northwest Section 407, which pumped 11.43 barrels of 43.7-gravity oil per day from perforations at 4900-10 feet. The test, 2 miles east of the Fitzsimmons pool, cored Yegua sand at 4901-16 feet and was drilled to 5087 feet. It was plugged back to 4936½ feet. While pumping gas volume amounted to 500 cubic feet per barrel.

After making a high gas/oil ratio, Bridwell Oil Company's W. L. Rogers A-1, in the north corner of Poitevent Survey No. 21 and 3 miles southwest of the Fitzsimmons pool, was being reworked. The wildcat flowed gas with a small amount of oil through 5/32-inch choke under 1350 pounds tubing and 1600 pounds casing pressure. Perforations had been made at 4923-39 feet.

Sal Vieja Oil Company and The Pure Oil Company's Garcia Land & Live Stock Company 1, in Santa Isabell Grant, Cameron County, was testing around 8500 feet. It had been drilled to 10,307 feet, plugged back and found salt water. A squeeze job was made and testing resumed.

New Starr County Strike

Sun Oil Company opened a new Frio-sand field 8 miles southwest of the Sun pool and on trend with the Rincon area of Starr County with W. G. Lehr 1, southeast Survey 513. After drilling to 5542 feet, the test was plugged back to 4140 feet and perforations made at 4127-37 feet where it pumped about 2 barrels of fluid per hour, mostly oil and some water. One mile farther south, the company's Claude King 1, Survey 511, cored sand at 4108-22 feet and on drill-stem test recovered 10 feet of mud at 3 pounds pressure. It was deepening.

A pumping test was being continued in Denzil Oil Company's Margaret Seabury 1, Block 6, Share 46, Porcion 80, northwest of the Ricaby field, Starr County. The well cored an oil sand at 1336-49 feet, and was producing about 23 barrels of oil per day.

M. M. Miller & Son's T. M. Gallagher 1, Block 1, Casa Blanca Grant, in the Northeastern portion of the county, flowed about 110 barrels per day of 39-gravity crude through ⅛-inch choke under 600 pounds tubing and 1200 pounds casing pressures after pipe had been perforated at 5187-95

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feet and 5197-5207 feet. Hole had been taken to 5624 feet, but plugged back. This test is in the vicinity of several other tests which indicated a possible producing structure in the area.

Five miles south of Bentonville and just west of the Nueces County line, H. H. Howell's San Antonio Joint Stock Land Bank 1, M Lopez grant, was preparing for a third test in a 5600-foot sand. After plugging back, it let water through holes at 5648-58 feet A second test at 5648-53 feet also netted water.

Gilcrease Oil Company was attempting to establish crude production in the Pundt or discovery sand of the Wade City field, Jim Wells County, with Pundt 1. The test cored the sand at 4813-19 feet, and on a drill-stem test recovered 500 feet of oil, 600 feet of salt water and 25 pounds pressure in 10 minutes. Hole was carried deeper to McNeill sand, stopping at 4974 feet, then plugged back for completion. The Pundt sand is a condensate producer in the discovery.

Nueces County Extension Indicated

Humble Oil & Refining Company may either extend the Corpus Christi or Saxet Heights field, Nueces County, to the north, or open a new submerged field in Nueces Bay. Texas 1, southwest Section 723, just north of the mainland and 2½ miles south of East White Point field, cored sandy shale at 3976-3979 feet and gas sand at 3979-4022 feet. It was deepening below 4350 feet without taking drill-stem test due to blow-out hazard. The sand is in the Catahoula and corresponds to one producing in the Saxet Heights field.

A new oil zone in the western portion of the East White Point field, San Patricio County, may result from Republic Natural Gas Company's E. A. Rachael 38. The test missed the regular 5600-foot pay and was carried to 6315 feet. Electric log and side-wall samples indicated an oil sand at 6275-6291 feet and distillate sand 5730-75 feet. Casing was set on bottom, perforations were made at 6275-80 feet, and the test was washing in

Gas Zone Extended at East Plymouth

Texon Royalty Company's completion of W. Roots 1, northeast Lot 4, Section 26, extended gas production in the East Plymouth area of San Patricio County more than a mile southwest. The test cored the Heterostegina sand at 4815-29 feet, drilled to 5813 feet and plugged back for completion through perforations at 4822-26 feet. It flowed dry gas through ⅛-inch choke under 1600 pounds tubing and 1900 pounds casing pressure.

Norsworthy Production Company was awaiting orders and may set casing to test a possible producing sand at 4427-4433 feet in Laura Fagan 1, 1½ miles northwest of Fagan field, Refugio County. The test, drilled on a Barnsdall Oil Company and Transwestern Oil Company farmout, had drilled to 6523 feet, failing to find production in the field's 5900-foot pay. Salt water was found in Coronado Corporation's K. L. Welder 1, which was testing in an effort to open a new area 3 miles southeast of Sea Drift, Calhoun County. The test had been carried to 10,002 feet, but plugged back and perforated at 8473-8487 feet.

Texas Gulf Coast

Brazoria County Wildcat Testing Below 9000 Feet

Rowan & Nichols' Hubbard 1, North Liverpool area, Brazoria County, remained in the front rank of potential pool openers, although side-wall coring attempts at 9874 and 10,010 feet, hampered by mechanical difficulties, were unsuccessful. On drill-stem test at 9107-34 feet, this wildcat flowed 100 feet of 51-gravity distillate and 35 feet of mud in 9 minutes under 500 pounds pressure. Oil and gas-distillate sands were cored at 8108-10 feet, 9094-9103 feet, and 9107-34 feet. Heterostegina was topped at 7200 feet, round Marginulina at 7380 feet, flat Marginulina at 7500 feet and Frio at 8100 feet.

Edwards Drilling Company was rigging Fidelity Oil & Royalty Company's Chenault 1, 2000 feet north of Sweeney, Brazoria County, between that town and Old Ocean production. There is now considerable activity in every direction from Old Ocean field, partially due to discovery of two new sands in Harrison & Abercrombie's BRLD 7, recent completion on the west edge of the field. Leasing has lapped into Matagorda County, trades and sales being reported in the Nichols, Battle-Perry & Williams, T. M. Duke and F. George surveys. South of the field leases in the O. Jones Survey are being taken for $75 an acre. Fidelity Oil & Royalty Company's location is closest to the Sweeney townsite, which has been leased by Shell Oil Company, Murray Fantham, Harrison & Abercrombie and P. D. MacDonald.

Brazoria County was still being subjected to intensive geophysical prospecting. Stanolind Oil & Gas Company was working two seismograph crews in the Parker and Robinson Surveys, Anchor area. Tide Water Associated Oil Company was working all roads in the county with gravimeter, while Humble Oil & Refining Company continues a soil-analysis survey. Glenn McCarthy's Munson 1, wildcat on the Bailey's Prairie prospect southwest of Angleton, was drilling below 11,570 feet. Sun Oil Company's Stern 1, long northeast extension attempt at Angleton, was standing preparatory to a test at 10,751 feet. Humble Oil & Refining Company's Mettler 2, north outpost at Angleton, is being prepared for test at 10,503 feet. Oil shows were logged at 10,491-501 feet, and gas-distillate shows in several zones up the hole. Mettler 2 is between the field proper and Mettler 1, long northeast extension recently completed by Humble Oil & Refining Company.

Wilson Creek Test Slowed

Attempts of Barnsdall Oil Company to complete Stoddard 1, second well at Wilson Creek, Matagorda County, have been hampered by cutting tool stuck in hole when a blowout two weeks ago brought the well in. Operators have been unable to run tubing in the hole, present flow of 410 barrels of 51-gravity distillate daily through series of chokes being through drill stem. The semi-wildcat first came in flowing 38-gravity oil from 10,295 feet, then bridged, giving operators a chance to install high pressure control head through which the well began to flow distillate. This structure, two miles west of deep Buckeye production, was found by reflection seismograph used to detail the Buckeye dome. United North & South Development Company's Stoddard 1-A, 1937 discovery at Wilson Creek, was producing 43 barrels of 52-gravity distillate daily. Analysis of cores from Stoddard 1 show that production is from the top of the Old Ocean series, the producing zone being about 80 percent sand and on a level with that in the United North & South Development Company well. The Texas Company's Pierce 1, Blessing area wildcat, was coring below 8890 feet with no shows reported. A drill-stem test of sands cored below 7900 feet showed gas and a negligible quantity of distillate. The company's Taylor 2, Sugar Valley wildcat, was drilling below 5725 feet. Harrison & Abercrombie are reportedly purchasing leases in Sugar Valley. Lease and royalty interest in the Battle, Berry and Williams surveys remains high despite recent failures in the area, latest of which was The Texas Company's Taylor 1.

Harris County interest was divided between Standard Oil Company of Kansas' Martens 1, Tomball field, and Richardson and Christian-Carpenter Drilling Company's E. Marks 1, Ogburn area wildcat. The former may be carried below present depth, 6002 feet, as an exploratory test of lower sands, or may be completed in the Cockfield which had satisfactory cores. Operators set 13⅜-inch surface pipe, and it is believed that the well will be carried considerably deeper. Richardson and Christian-Carpenter Drilling Company's E. Marks 1 set pipe at 7248 feet for a series of production tests. Within the past three weeks, a series of drill-stem tests indicated possible production from three zones. At 6614-21 feet, a 10-minute test recovered 300 feet of oil-cut mud and free 37-gravity green oil through ¼-inch chokes under 3000 pounds bottom-hole pressure. Test at 6943-48 feet recovered 6400 feet of salt water and oil in 35 minutes. Test at 6799-811 feet recovered 18 stands of gas and salt water, another at 6449-6447 feet recovered 25 stands of mud and free oil under 80 pounds pressure. It is possible that perforations will be made in all of these zones, starting with the 6614-21-foot sand, before the well is made or abandoned. Same operator's Josey Farms 1, Cypress area wildcat, was drilling below 6585 feet.

Standard Oil Company of Kansas has temporarily abandoned Kamas 1, deep wildcat on the north flank of Brenham dome, 1½ miles southeast of Wesley, Washington County, at 5039 feet, with no correlations announced. The test, drilled on acreage in the S. M. Williams Survey procured from C. H. Lane, is projected to the Wilcox at 6000 feet. Several previous attempts to develop the deep Sparta have failed. Continental Oil Company and Freeport Sulphur Company have worked the dome with gravimeter and torsion balance.

One location was announced and another was rumored for the Port Neches field, Orange County, as a result of Phillips Petroleum Company's recent completion of Stark 1, north of The Texas Company acreage, for 528 barrels of 25-gravity oil daily through ¼-inch choke from a new sand at 4555-60 feet. Phillips Petroleum Company staked Stark 2, 660 feet east of Stark 1. The Texas Company's Stark 11, outpost a mile west of production, was conditioning mud and hole at 7195 feet, and will deepen although reportedly 350 feet low on structure. Oil Interest Corporation's Todd 1, north outpost, is expected to spud within the week.

North of Joe's Lake, in the Spurger area

of Tyler County, Dick Schwab's Fletcher Lumber Company 1 was running electric log at 7700 feet. All cores taken from the Cockfield sands showed salt water. Atlantic Refining Company has a magnetometer in the southern part of the county, and a seismograph crew working the Hutchins "D" Survey, west of Joe's Lake. Independent Explorations Company is seismographing for Texas Gulf Producing Company in the A. J. Wyman Survey, southwest corner of Newton County.

Hulen 1, Stanolind Oil & Gas Company's discovery at Alta Loma, Galveston County, continued to flow 700 barrels of fluid daily, with water-cut reported from 60 to 90 percent. Operators have set surface casing in Hulen 3, 400 feet west of the discovery which will be diverted as a relief well for Hulen 1 if present attempts to control the discovery are unsuccessful. Operators have derrick up for Hulen 2, 1500 feet southwest of the discovery.

Harrison & Abercrombie abandoned Dixon 1, wildcat in the Shepard area of San Jacinto County, at 8870 feet, after checking 100 feet low in the lower formations. Housh & Thompson drilled the well.

Texas Schedules Monthly Gas Hearing June 20

The monthly gas hearing of the Texas Railroad Commission has been scheduled for June 20, at Austin. Texas statutes require that a hearing be held every month on gas, but there is no such provision governing oil.

Usually the two are held together, but at the statewide oil proration hearing last month, the commission announced no hearing would be held unless it became necessary to revise the oil proration order. Ten days' notice is required before any such hearing may be held.

Texas Permits

The Texas Railroad Commission last week approved permits for drilling 296 wells in Texas, 244 more than were allowed the week before.

One permit was granted in the East Texas field in Gregg County, while 9 locations were reported from the remainder of East Central Texas.

Southwest Texas led the state with 92 permits, including 14 in Jackson and 13 in Jim Wells County. Gulf Coast operators listed 28 locations. The commission approved permits for 56 wells in West Texas, including 17 in Ector and 11 in Pecos County, while West Central Texas producers reported 28 locations.

From the North Texas District 56 permits were listed, including 15 in Archer and 14 in Wichita County. Panhandle operators were allowed to drill 26 new wells, including 10 in Hutchinson County.

Louisiana Permits

Fifty-eight drilling permits were authorized last week by the Louisiana Conservation Commission of which 18 were in North Louisiana distributed among the following parishes: Caddo 10, Claiborne 1, La Salle 2, Madison 1, Morehouse 2, Ouachita 1, and Sabine 1. The 40 in South Louisiana were in the following parishes: Acadia 4, Allen 1, Avoyelles 2, Calcasieu 2, Cameron 3, East Baton Rouge 3, Evangeline 4, Iberia 1, Jefferson Davis 1, LaFourche 7, Plaquemines 3, St. Charles 1, St. James 1, St. Landry 1, St. Mary 3, St. Martin 2, and Terrebonne 1.

Louisiana Gulf Coast

Trilby Test Shows for Field Opener; Important Tests Dry

Vincent & Welsh and Nicklos Drilling Company appear to have found a new field with McManus 1, Trilby area wildcat in Acadia Parish. On drill-stem test at 3525-35 feet, the well flowed gas and oil under 1000 pounds pressure. Previous wells in this area, also known as the Richie prospect, have had satisfactory shows, but little or no pressure. Operators have not yet announced intention to attempt completion in this zone, or to drill deeper.

Last week saw two of Coastal Louisiana's wildcats abandoned after consistently discouraging results. Humble Oil & Refining Company abandoned the deepest active test in the state, Sugars 1, on the East Labadieville prospect, LaFourche Parish, at 12,600 feet with no shows worthy of test reported. This depth is but 700 feet short of the record established by Fohs Oil Company at Bay Baptiste, second deepest well in the world.

Sid Richardson abandoned Haas Investment Company B-1, a mile north outpost at Eola, Avoyelles Parish, at 9400 feet. This test attracted statewide attention because of the possible effect of a new sand on Eola's already tremendous reserve. The outpost test found Cane River at 7850 feet, Cane River Fossil Zone at 8424 feet, and top of Wilcox at 8560 feet. Amerada Petroleum Company completed Feret 1, Eola, for 649 barrels daily from 10,170 feet. There are now 83 producing wells in this field.

Three other deep wildcats were abandoned. At Crown Point, Jefferson Davis Parish, Vendome Petroleum Company quit Whitney-Coulon 1 at 10,600 feet in shale. This test, 4 miles northeast of Barataria, logged shows at 8300 feet which drill-stem test failed to verify. Shell Oil Company left Schwing Lumber Company 1, Happytown area, St. Martin Parish, at 10,946 feet with no shows in the regular pay, and a salt water and gas show at 9900 feet. Humble Oil & Refining Company abandoned Atkinson 1, South Crowley area, Acadia Parish, at 9400 feet. This abandonment is believed to be only temporary, as casing was recently set, and no test attempts have been reported.

Gulf Refining Company's Bowie Lumber Company 1-B, Lake Boeuf, LaFourche Parish, which became the deepest active test in the state when Humble Oil & Refining Company abandoned Sugars 1, East Labadieville, same parish, was plugged from 12,512 feet to 12,200 feet, and operators were perforating at 11,990-12,010 feet for drill-stem test. A series of previous tests at 12,230-240 feet recovered 5580 feet of salt water under high pressure. With failure of these tests, prospect for a 12,000-foot field were considerably lessened, as shows higher in the hole were reportedly weak in the cores, although electric log showed decided kicks at 11,988-12,010, and 12,019-044 feet.

In Calcasieu Parish, W. T. Burton was moving in materials for Mayo Realty 1, wildcat on the South Lake Charles prospect, Section 8-11s-8w. Continental Oil Company has seismograph crews in 10s-7w and 11s-7w, Manchester area, while Union Sulphur Company is leasing in the same vicinity for a general shooting program.

Gulf Refining Company has taken up its option on a 12,000-acre block of Petit Anse Company land on the Avery Island dome, Iberia Parish, with a contract calling for two 11,000-foot holes with first test due by January 1, 1941. The Texas Company drilled one deep failure on this prospect, and paid a substantial forfeit to satisfy commitment for another. The acreage, which lies in 13s-5e and 13s-6e, was turned by The Texas Company to Louisiana Land & Exploration Company, who turned it to Petit Anse Company.

Herton Oil Company's Banta 10 has been completed for 700 barrels of pipeline oil daily through ¼-inch choke from 10,373 feet to open a new deep sand for the Jeanerette field, St. Mary Parish. The company, which is the sole producer in the field, has already established 9900-foot and 10,200-foot productive zones

Cameron Meadows field, Cameron Parish, may have its second new sand in as many weeks as W. T. Burton's School 5, on the north flank of the dome, logged sands at 4200-76, 4440-60 and 5600-20 feet. Pipe has been set for completion. Previously Magnolia Petroleum Company's Cameron Meadows 28, southwest edge well, established 200-barrel daily production from a new sand at 6232-50 feet.

North Louisiana

Deep Wildcats Started in Sabine and Webster Parishes

The Olla field, LaSalle Parish, producing from the shallow Wilcox horizon, added its thirteenth producing well last week and continued to be the most active field in North Louisiana except the old shallow Pine Island field in Caddo Parish. Most of the Olla wells are showing 5 to 50 percent salt water.

In Sabine Parish on a 75,000-acre block which it spent several months assembling and in geological and geophysical exploration, Shell Oil Company, made location for Pickering Lumber Company 1, C NE SW 30-4n-12w, which will go to 8500 feet. This is on the south flank of the Sabine Uplift.

In Webster Parish, W. C. Feazel of Monroe, Louisiana, will drill Tillman 1, NWc NE 11-17n-9w.

Location was made for a proposed 6000-foot wildcat test in south Caddo Parish, at J. M. Conner's (Pittsburgh, Pa.) Williams A-1, SE NE 3-15n-15w, near Spring Ridge. Conner recently abandoned a 5500-foot wildcat on the same block, having taken over the latter operation from L. I. Davis.

Three miles northeast of Olla production, O. K. Allen, Jr., shut down in

the Wilcox at Breedlove 1, C SW NE 32-11n-3e, after topping Wilcox at 1590 feet. Elevation is 129 feet. Farther northeast, H. L. Hunt is making a deep test of Louisiana Central 17, C NW SE 19-11n-3e, which is drilling below 4810 feet after topping Wilcox at 1590 feet (elevation 176 feet) and logging several sections of sand showing oil and salt water at the Olla producing level between 2200 and 2410 feet. Top of Midway was 3880 feet.

Arkansas

Two Wildcats Rate As Potential Pool Discoveries

Two wildcats on geophysical prospects were completed last week in South Arkansas as potential openers of new fields. One, non-productive in the deep lime, was plugged back and completed in the Paluxy.

In LaFayette County, Atlantic Refining Company completed Bodcaw Lumber Company 1, CNE SW 29-17-23, as a distillate well at 9221 feet, flowing 10 barrels per hour through 11/64-inch tubing choke, with casing pressure of 3100 pounds and tubing pressure of 2950 pounds. The gas/oil ratio was 8500 to 1. The well was washed in and started to flow into separator, the distillate being 58.5 gravity and straw-colored. On first gauge, it flowed 20 barrels per hour on 14/64-inch choke with a gas/oil ratio of about 9000 to 1. With elevation of 273 feet, this test reached the gas/oil contact at 9122 feet and established the water level at 9205 feet, drilling to bottom at 9221 feet.

After drilling to 9550 feet in Smackover lime, Standard Oil Company of Louisiana's W. P. Sturgis 1, C NW SE 1-17-27, Miller County, was plugged back and completed as an oil well after casing was perforated in the Paluxy at 3576-3606 feet. With elevation of 346 feet, this test logged the Paluxy at 3586-3606 feet and logged massive anhydrite at 4971-5130 feet. The well was washed in making 22 barrels of 30-gravity oil per hour on open choke, 30 percent wash water. Later it gauged 100 barrels in 24 hours through ⅛-inch tubing choke, with casing pressure of 185 pounds and tubing pressure of 120 pounds.

In the Atlanta field, Columbia County, Grady Vaughn's Talley 1, N½ NW SE and N½ NE NW 15-18-19, drilled to 8220 feet, swabbed salt water with no trace of oil, and was preparing to retest. It logged Smackover lime at 8191 feet, topped Reynolds lime at 8204 feet, and topped porosity at 8214 feet. It is a south edge test, and may define producing limits in that direction.

Four drilling permits were authorized last week by the Arkansas Oil & Gas Commission, as follows: Columbia County—Tide Water Associated Oil Company and Seaboard Oil Company's Hutcheson 1, NE SE 16-18-19; Standard Oil Company of Louisiana's Longino B-3, CSW SE 19-17-19; LaFayette County—East Texas Refining Company and Erwin & Leach's Bodcaw Lumber 2, NW NE NE 19-16-23; Union County—Marine Oil Company's Thompson Estate B-6, SE SE SW 3-18-13.

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Work at Tinsley Dome Continues Decline

Three new wells were completed last week in the Tinsley Dome field and three Mississippi wildcats were abandoned. Two wildcat locations were announced in Mississippi and one in Alabama.

One of the wells completed at Tinsley Dome extended production slightly north, this being Slick-Urschel Oil Company's Slick 6, SW SE 35-11n-3w, completed at 4817 feet in 17 feet of sand. The same company is already drilling on Slick 7, SWc 36-11n-3w. Two other locations were made at Tinsley Dome during the week. However, drilling there has shown an appreciable decline in recent weeks.

Wildcat tests were abandoned in Holmes, Smith and Warren Counties, all three abandonments being 5000 feet or deeper. New wildcat locations were announced in Hinds and Scott Counties. Mrs. S. O. Thompson is digging pits for Catchings 1, Section 22-5n-1w, several miles west of production in the Hinds County part of the shallow Jackson gas field. E. L. Martin of Oklahoma City made location for his second test on a wildcat block in Scott County, Newell A-1, NE NE 5-6n-7e.

In Walker County, Alabama, 2 miles northeast of Carbon Hill, Champlin Oil & Refining Company was preparing to drill Galloway 1, Section 12-13s-9w.

Through R. W. Williams of Shreveport, Gulf Refining Company has purchased 50,000 acres of scattered leases from the Federal Land Bank in various counties extending from Yazoo County southeast to Mobile County, southwest Alabama. Humble Oil & Refining Company is reported active in southwest Alabama, and is securing leases in Mobile and Washington Counties.

W. J. McCallahan's J. A. Stafford 1, SE NE SW 24-7s-3w, at Bayou La-Batre, Mobile County, Alabama, is not being abandoned but is shut down at 6385 feet in chalk.

Gulf Refining Company made a test below 5700 feet in its Tallahatchie County, Mississippi, wildcat, T. P. Carson 1, C NE 2 21n-1w. With elevation of 145 feet, this test topped chalk at 2570 feet and topped Eutaw (Blossom) at 3275 feet, being in igneous at 5724 feet and still drilling.

Exchange Oil Company was loosening stuck stem at 1300 feet in its Scott County wildcat, Newell 1, NW NE SW 30-7n-7e, whose total depth is 6500 feet in shale. With elevation of 411 feet it logged chalk from 3980 to 5100 feet. In Madison County, Ralph A. Johnston's F. H. Ray 1, C SE SW 6-8n-3e, a wildcat, drilled below 5650 feet in shale after topping Tallahatta at 1345 feet, topping Wilcox at 1630 feet and topping chalk at 4568 feet; elevation is 230 feet.

W. C. Brooks, Memphis, advises that a report in THE OIL WEEKLY of June 10 to the effect that Gulf Refining Company will drill on his fee in Section 31-19n-7e, Montgomery County, is in error, and that his holdings there have not been leased.

Michigan

Remote Wildcat Drills Show in Monroe Dolomite

Close in the wake of a shallow Southwestern Michigan discovery a week ago and a probable small basin wildcat producer, another wildcat last week in the far northern tip of the "thumb" drilled Monroe dolomite saturation.

C. W. Teater and Wallace Markles' Johnston 1, SE SE SW 8-17n-14e, Huron County, carried 200 feet of oil at 2652 feet where it was shut down for test. The wildcat logged Dundee at 2120 feet and had oil shows at 2180 and 2340 feet before going into water. A 5-inch casing string was set at 2638 feet, 155 feet in the Upper Monroe dolomite, and an oil-gas pay was drilled at 2644-52 feet. Operators announced intentions to acidize and test the 2644-52 foot pay before drilling deeper.

Johnston 1 is first test to do better than show in Huron County, and if made commercially productive would be the first producer in the "thumb" proper of Michigan. Closest commercial production now is in Tuscola County, 40 miles southwest of the current development. Huron County has been played off and on for several years, but is not extensively leased at the present time. A preliminary check revealed that majors carry only odd-and-end acreage. Teater, who discovered the Porter field in 1933, has been Huron's most active and persistent campaigner.

Reports on the grade of the oil from Johnston 1 were conflicting, and no complete analysis had been made. The Tuscola County field, which produces from about 800 feet below the top of the Dundee, has a crude which is highly paraffinic and carries the highest sulphur content of any known commercial crude in the state. Although discovered in 1938, operators have been unable to market the crude in any large or steady amount. The Huron crude showed about the same color, very dark, but it had a less penetrating sulphur odor.

Two tests had been started and seven more locations staked in the area of H. C. Nelson's Peters 1, Section 8-4n-14w, Overisel township, Allegan County, which initialed 300 barrels natural from Traverse at 1480 feet. A typical shallow boom flurry of drilling was underway in an attempt to grab production and define the pool.

Sun Oil Company's Cameron 1, Section 10-18n-2w, Grout township, Gladwin County, however, had not been definitely established a commercial wildcat last week. Test carried 900 feet of fluid in 70 hours natural in Dundee lime at 3841 feet. It was plugged back to 3838 feet and acidized with 1000 gallons on June 7. It would not flow and attempts to pump were not entirely successful. Around 30 barrels of oil had been recovered up to the first of the week, and later the well carried 890 feet of oil in 5-inch casing.

Sun Oil Company abandoned plans to carry State A1, SW SW 4-20n-3w, Clare County wildcat, to the Sylvania, when more water started to come in than could be safely carried. It was junked at 5028 feet. Top of Dundee was logged at 4008 feet, and no shows were found.

C. L. Maguire, Inc.'s Clark 1, Section 32-16n-2w, Midland County, continued shut down for orders at 5117 feet, top of the Sylvania.

Michigan Devonian Petroleum Company and Pure Oil Companys' joint development campaign in the Sylvan township, Osceola County, district, 18n-7w, probably will bring a 4000-foot test of the Monroe lime late this month. First of three or more slim holes to the 1700-foot Marshall-Red marker sections was completed this week. One of the tests will be carried to the objective. Portable rotary is being used for the core tests.

Meanwhile, drilling on the last of a series of five Marshall-Red tests, running from 1500 to 1700 feet, was to be completed in the Winterfield, Redding and Lincoln township district of Clare County by Taggart Brothers, Inc. Stray sand gas rights on several thousand acres were assigned to them in a deal with The Pure Oil Company, Sun Oil Company, The Carter Oil Company and Gulf Oil Corporation. One of the five tests is scheduled for the 4000-foot Monroe lime section.

Two highly rated basin wildcats were due to test objectives this week. Rowmor & Hughes' Vallad 1, Section 25-20n-7w, Osceola County, was drilling below 3900 feet with Monroe top slated to be logged by mid-week. Farther north in Wexford County, completion of Dr. Virgil R. D. Kirkham's Whaley 1, Section 24-21n-9w, again was delayed when a 5-inch cement job at 4030 feet failed to hold.

Keyson Oil Company was having trouble getting a casing seat that would hold under acid pressure treatment on Steele 1, Section 32-2n-11w, Allegan County wildcat. Test logged Traverse lime oil saturation two weeks ago at 1621 feet.

Rocky Mountain Area

New Market for Oil Boosts Activity at Kevin-Sunburst

Production in northern Montana has been upped sharply with the removal of restrictions from Kevin-Sunburst, second largest producing district in the state. The field, which normally produces around 4800 barrels daily, reports an output of 8500 barrels a day on June 7, with an all-time peak of 10,000 barrels produced during 1 day of the previous week. The increase dates from May 15 when International Refining Company announced that effective until further notice it would take all crude available from the field.

Approximately 200 idle wells have been cleaned out and replaced on production in the pool and 18 rigs are active in the area as operators rush new completions to take advantage of the flush production permitted under the new market expansion. Several operators are unable to start work immediately as a result of a lack of drilling equipment to handle additional contracts.

Drilling operations in other Rocky Mountain districts continue to advance steadily. A faulted condition was encountered in Mackinnie Oil & Drilling Company's proposed deep test well in the Horne Valley structure, Carbon County, Wyoming, and operators are preparing to abandon.

Baxter Basin, Sweetwater County, in which 2 deep tests are getting underway and a third well, an old producer, deepening to test lower horizons, was in line for additional work this week as Union Gas Company spotted location for Hummer 1, NW NW NE 6-17n-103w, a new start in South Baxter Basin. Road is being built to move in standard tools.

Deep Tensleep test on the North Baxter Basin area, Gus Pomgratz et al's Clark 1, NE NE NE 22-19n-104w, is drilling below 1000 feet. In the Middle Baxter Basin field, Red Desert Corporation's Aspden 1, CNW SW NW 34-18n-103w, is still moving in heavy rotary tools for a test to Tensleep. Mountain Fuel Company is drilling below 3622 feet in R. D. Murphy 1, SE SE SE 26-17n-104w, an old producer at South Baxter Basin which is to test lower sands.

Deepening operations are also being carried out in the Continental Oil Company's Whitaker 1, CEL NW NW 30-8n-68w, an old producing location in the Fort Collins field. Larimer County, Colorado. Old bottom is at 4686 feet in Muddy sand.

New Mexico

Vacuum Extension South Seen Along Three-Mile Front

Production trend south of Vacuum, Lea County, is due to provide extensions that will be a factor in future developments. Expansion of the field to the south along a 3-mile front is a possibility. The Texas Company's State 7-R, C NW SE 1-18s-34e, paved the way for more extensions in completing one of the largest natural producers with a potential rating of 1600 barrels through open tubing. Production is from broken pay at 4330-4710 feet with an elevation of 3998 feet. The company's State 1-AB, a mile east, swabbed and flowed 321 barrels potential after using acid at 4400-4710 feet.

Shrinkage in the market demand for Eddy County crude resulted in the well allowable being reduced to 48 barrels daily after being held to 65 barrels daily for 8 months. Some of the purchasers have been restricting their runs below the figure set by the state since spring.

Seven dry holes and marginal wells completed within recent months along the southeast flank of the Loco Hills field has eliminated considerable acreage heretofore classed as probably productive. These failures have reflected a reduction in field activities, and will likely result in an revival of wildcatting.

UNITED STATES WELL COMPLETIONS

Alabama

Marion County (Wildcat)—
Seaboard Oil Co., Clark 1, 28-11s-14w — Init. Prod. Bbls.: * — Depth: 645

Arkansas

Clark County (Wildcat)—
Coker Oil Co., Cabe 4, 8-10-20 — Init. Prod. Bbls.: * — Depth: 486

Columbia County (Atlanta)—
Tide Water Associated-Seaboard Oil Co., Murphy 2, 14-18-19 — Init. Prod. Bbls.: 290 — Depth: 8177
Talley 1, 14-18-19 — Init. Prod. Bbls.: 200 — Depth: 8169

LaFayette County (Wildcat)—
Atlantic Ref. Co., Bodcaw Lbr. Co. 1, 29-17-23 — Init. Prod. Bbls.: 480 — Depth: 9221

LaFayette County (Lewisville-Stamps)—
Erwin & Leach et al, Davis 2, 19-16-23 — Init. Prod. Bbls.: 150 — Depth: 3480

Miller County (Wildcat)—
Standard Oil Co. of La., Sturgis 1, 1-17-27 — Init. Prod. Bbls.: 100 — Depth: 9550

Union County (Nick Springs)—
Fohs Oil Co., Grace 1-A, 31-17-14 — Init. Prod. Bbls.: 250 — Depth: 3766

California

Fresno County (Coalinga Northeast)—
Amerada Pet. Corp., Ewing 1-20B — Init. Prod. Bbls.: 596 — Depth: 8203
Standard, No. 68-19B — Init. Prod. Bbls.: 2332 — Depth: 8270

Kern County (Buena Vista)—
General Pet., BVA 1 — Init. Prod. Bbls.: * 11,886

Kern County (Cole's Levee)—
Ohio Oil, KCL F8-41-11 — Init. Prod. Bbls.: No Est. — Depth: 9808

Kern County (Edison)—
Monterey Explor. Co., Hershey 8 — Init. Prod. Bbls.: 175 — Depth: 1400

Kern County (Greeley)—
Superior Oil, Merrill 1 — Init. Prod. Bbls.: 1320 — Depth: 11,500

Kern County (McKittrick)—
Freda G. Oil Corp., Laymance 3 — Init. Prod. Bbls.: 75 — Depth: 1245

Kern County (Mount Poso)—
Hall-Baker Co., Villard 1 — Init. Prod. Bbls.: * — Depth: 1967

Kern County (Pyramid Hills)—
Tide Water, West Slope 1 — Init. Prod. Bbls.: 40 — Depth: 2087

Kern County (Rio Bravo)—
Union Oil, Kerneo 45-34 — Init. Prod. Bbls.: 1685 — Depth: 11,470

Kern County (Round Mountain)—
Crestmont Oil Co., Coffee 3 — Init. Prod. Bbls.: 50 — Depth: 1422

Los Angeles County (Dominguez)—
Shell Oil, Reyes 104 — Init. Prod. Bbls.: 842 — Depth: 7575
Union, Austin 2 — Init. Prod. Bbls.: 415 — Depth: 7479

Los Angeles County (Long Beach)—
R. B. Mitchell Oil Co., Mitchell 1 — Init. Prod. Bbls.: 110 — Depth: 4250
Union, LBC 20 — Init. Prod. Bbls.: 5 — Depth: 5879

Los Angeles County (Montebello)—
Brookline Oil Co., Drake Comm. 1 — Init. Prod. Bbls.: 400 — Depth: 7770
Montebello Oil Co., Wallace-Farish 1 — Init. Prod. Bbls.: 250 — Depth: 7678
Montebello Reservoir Oil Co., Reservoir 1 — Init. Prod. Bbls.: 350 — Depth: 7794

Los Angeles County (Newhall-Potrero)—
Barnsdall, RSF 9 — Init. Prod. Bbls.: 60 — Depth: 7195

Los Angeles County (Rosecrans Athens)—
Southern Calif. Pet. Corp., Rowena 1 — Init. Prod. Bbls.: 646 — Depth: 7734

Los Angeles County (Stanton Area)—
United Oil Co., Schimming 1 — Init. Prod. Bbls.: * — Depth: 9310

Los Angeles County (Wilmington)—
Simon Bernstein, LBH 16 — Init. Prod. Bbls.: 175 — Depth: 3520
Continental Corp., LACFCD 6 — Init. Prod. Bbls.: 504 — Depth: 3022
Hamarson Oil Co., No. 3 — Init. Prod. Bbls.: No Est. — Depth: 3477
Gus Pongratz Oil Co., Ronan 2 — Init. Prod. Bbls.: 350 — Depth: 3577
Royalty Service Corp., Durand 1 — Init. Prod. Bbls.: 320 — Depth: 3610
Union Pacific RR Co., UP 135 — Init. Prod. Bbls.: 121 — Depth: 5610
UP 140 — Init. Prod. Bbls.: 855 — Depth: 5369
Vulcan Oil Co., "W" 2 — Init. Prod. Bbls.: 300 — Depth: 3630

Tulare County (Trico Area)—
Standard, Rideout 1 — Init. Prod. Bbls.: [9] 48(A) — Depth: 2529

Illinois

Clinton County—
J. D. Etheridge, Dunbar Cementry 1, swc se se 1-1n-1w — Init. Prod. Bbls.: 315 — Depth: 2936
Ring & MacLean, Ranseman 2, se sw se se 1-1n-1w — Init. Prod. Bbls.: 796 — Depth: 2924
Samedan Oil Co., Hanseman 1, ne sw nw se 1-1n-1w — Init. Prod. Bbls.: 3320 — Depth: 2887
Shell, Pitchford 2, cw½ ne sw 1-1n-1w — Init. Prod. Bbls.: 5747 — Depth: 2882
Bert Fields, Allison 3, ne nw ne ne 12-1n-1w — Init. Prod. Bbls.: 670 — Depth: 2925
Gulf, Beuhler 20, sw c nw ne 12-1n-1w — Init. Prod. Bbls.: 1023 — Depth: 2924
Beuhler 22, ce½ ne nw 12-1n-1w — Init. Prod. Bbls.: 3029 — Depth: 2919
Hughes Pet. Co., Allison 1, ne se se ne 12-1n-1w — Init. Prod. Bbls.: 84 — Depth: 2930
T. W. Lee, Allison 1, se sw se ne 12-1n-1w — Init. Prod. Bbls.: 620 — Depth: 2930
Thompson Dr. Co., Hanseman 4, nw ne nw ne 12-1n-1w — Init. Prod. Bbls.: 860 — Depth: 2919
O. W. Burroughs, Knolhoff 2, sw se 2-1n-2w — Init. Prod. Bbls.: 12 — Depth: 1334
Max Pray & Bell, Knolhoff 3, se c sw 2-1n-2w — Init. Prod. Bbls.: 132 — Depth: 1328
Paul Mosebach, Robbin 1, se sw sw 5-1n-3w — Init. Prod. Bbls.: 155 — Depth: 2460

Coles County—
Carter, Seaman 1, se ne sw 35-12n-7e — Init. Prod. Bbls.: 121 — Depth: 2027

Edwards County—
Noah & Morrison, Barnes 2, ne ne ne 24-2s-10e — Init. Prod. Bbls.: 190 — Depth: 2388
Superior, Woods 4, nw nw nw 19-2s-11e — Init. Prod. Bbls.: 140 — Depth: 2361

Fayette County—
Texas, Neathery 5, se nw nw 6-6n-3e — Init. Prod. Bbls.: 196 — Depth: 1539
Wright 8, se nw sw 31-6n-3e — Init. Prod. Bbls.: 245 — Depth: 1600
Ohio, Schwarm 13, sw sw nw 31-6n-3e — Init. Prod. Bbls.: 195 — Depth: 1620
Zephyr, Smith 7, sw se sw 31-6n-3e — Init. Prod. Bbls.: 300 — Depth: 1626
Blalock & Walters et al, Welker 1, se ne nw 18-7n-3e — Init. Prod. Bbls.: 75 — Depth: 1505
Johnson, Logue 5, se sw sw 18-7n-3e — Init. Prod. Bbls.: 85 — Depth: 1551
Carter, Heckert 4, se nw se 8-7n-3e — Init. Prod. Bbls.: 108 — Depth: 1480
Doty 3, sw nw ne 13-8n-3e — Init. Prod. Bbls.: 128 — Depth: 1533
Kline 3, sw sw nw 13-8n-3e — Init. Prod. Bbls.: 414 — Depth: 1525
Phillips 3, nw nw sw 13-8n-3e — Init. Prod. Bbls.: 240 — Depth: 1525
Doty 4, se se ne 14-8n-3e — Init. Prod. Bbls.: 480 — Depth: 1514
Logue 1, sw se sw 23-8n-3e — Init. Prod. Bbls.: 168 — Depth: 1479
Rhodes 3, se ne ne 27-8n-3e — Init. Prod. Bbls.: 126 — Depth: 1574
Stewart, Gordon 1, se sw se 35-9n-3e — Init. Prod. Bbls.: 80 — Depth: 1554
Gordon 2, sw se se 35-9n-3e — Init. Prod. Bbls.: 60 — Depth: 1533

Hamilton County—
Kingwood, Wilson 3, ese nw se 6-6s-7e — Init. Prod. Bbls.: 400 — Depth: 2707

Jackson County—
Barton et al, Hall 1, nw nw sw 8-9s-1w — Init. Prod. Bbls.: * — Depth: 2056

Jasper County—
Pure, Aldridge 1, ce½ ne nw 17-5n-10e — Init. Prod. Bbls.: 1422 — Depth: 2850
Warren 1, cw½ ne nw 33-6n-10e — Init. Prod. Bbls.: 57 — Depth: 2875
Richart Aten, Mendenhall 1, sw sw se 17-8n-10e — Init. Prod. Bbls.: * — Depth: 2062

Marion County—
Atwood, Dale 1, sw c nw 7-1n-1e — Init. Prod. Bbls.: 100 — Depth: 2929
Hooks & Ring, Cronkhite 1, lot 6, blk 14, 7-1n-1e — Init. Prod. Bbls.: * — Depth: 2961
Leroy Cussy, Lavery 1, swc nw 7-1n-1e — Init. Prod. Bbls.: 144 — Depth: 2927
Scott-Carey, Keenan 1, lot 2, blk 2, 7-1n-1e — Init. Prod. Bbls.: * — Depth: 2936
Langenfeld 1, lot 17, blk 2, 7-1n-1e — Init. Prod. Bbls.: 380 — Depth: 2927
Illinois-Iowa Power Co., Fee 3, nw se nw sw 18-1n-1e — Init. Prod. Bbls.: 730 — Depth: 2908
Ohio, Murray 15, nwc ne sw 7-1n-2e — Init. Prod. Bbls.: 120 — Depth: 1861
Texas, Carr 1, ne se ne sw 6-1n-2e — Init. Prod. Bbls.: 203 — Depth: 2090
Carr 7, cn½ ne ne 7-1n-2e — Init. Prod. Bbls.: 455 — Depth: 2015
Tate 7, cn½ sw ne 7-1n-2e — Init. Prod. Bbls.: 210 — Depth: 2035
Fyke 6, swc se 8-1n-2e — Init. Prod. Bbls.: 147 — Depth: 2136
Jett 32, se sw sw 16-2n-2e — Init. Prod. Bbls.: 1795 — Depth: 3520
Martin 14, sw sw se 17-2n-2e — Init. Prod. Bbls.: 1150 — Depth: 3485
Sweney 10, nw sw ne nw 20-2n-2e — Init. Prod. Bbls.: 509 — Depth: 3495
Chapman 23, se nw ne sw 28-2n-2e — Init. Prod. Bbls.: 100 — Depth: 3489
Lee 14, nwc se sw 28-2n-2e — Init. Prod. Bbls.: 1395 — Depth: 3455
Friedrich 21, sw nw nw 29-2n-2e — Init. Prod. Bbls.: 620 — Depth: 3525
Friedrich 29, ne nw nw sw 29-2n-2e — Init. Prod. Bbls.: 665 — Depth: 3432
Friedrich 30, nw se se ne 30-2n-2e — Init. Prod. Bbls.: 1558 — Depth: 3480

Summary of Drilling Operations in the United States, Week Ended June 15, 1940

	WELLS COMPLETED							*PERMITS FOR NEW WELLS				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1940	Total this Date 1939	This Week	Total this Month	Total 1940	Total this Date 1939	Year Total 1939
Alabama	1	.....	.....	1	.....	1	1	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	7	6	.....	1	1,470	91	103	4	6	66	106	223
California	30	26	1	3	11,976	625	486	[a]	10	492	476	1,174
Colorado	.....	.....	.....	.....	.....	.....	11	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	3	1	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois*	85	79	.....	6	51,151	1,701	1,677	128	263	2,034	.....	893
Indiana	8	3	.....	5	360	182	74	.....	.....	.....	.....	.....
Kansas	43	38	1	4	59,442	835	594	45	45§	902	672	1,583
Kentucky	9	3	.....	6	38	127	283	.....	.....	.....	.....	.....
Louisiana	68	46	6	16	10,809	780	457	48	67	775	596	1,449
Michigan	23	7	2	14	1,336	589	628	24	47	548	597	1,419
Mississippi	6	3	.....	3	1,504	92	2	.....	.....	.....	.....	.....
Missouri	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....
Montana	3	3	.....	.....	320	74	52	.....	.....	.....	.....	.....
Nebraska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Mexico*	14	10	.....	4	7,147	348	289	5	15	323	.....	293
New York	21†	21†	.....	.....	47	481	218	.....	.....	.....	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	40‡	19	8	13	151	389	378	.....	.....	.....	.....	.....
Oklahoma	49	25	5	19	1,686	1,018	947	27	27§	865	963	2,059
Pennsylvania	46†	36†	6	4	42	1,212	587	.....	.....	.....	.....	.....
South Dakota	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Tennessee	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....
Texas	258‡	180	6	72	79,801	4,935	4,575	296	348	5,791	4,979	10,269
Utah	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
West Virginia	17‡	3	14	.....	29	254	218	.....	68	190	291	718
Wyoming	.....	.....	.....	.....	.....	61	61	.....	.....	1	.....	.....
Total this week	728	508	49	171	227,309	13,757	11,643	577	896	11,987	8,680	20,075
Total last week	489	379	14	96	206,306	13,029	11,084	319	319	11,410	8,312	20,075
Total this year	13,757	10,086	745	2,926	5,236,301	.....	.....	.....	.....	.....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.
‡ Includes week of June 8 and week of June 15, 1940, for Ohio, West Virginia and South Texas.
§ Figures for Oklahoma and Kansas not available for week of June 8, 1940.
[a] Figures for week ending June 15, not available.

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Maxwell 9, ne sw ne se 30-2n-2e	2100	3430
Maxwell 10, se ne ne se 30-2n-2e	3063	3430
Stroup 17, ne sw sw se 30-2n-2e	1910	3411
Tate 19, nec se sw 31-2n-2e	1805	3430
Weyman 32, se nw nw ne 31-2n-2e	1513	3398
Kingwood & Bell, Shanafelt 25, ne nw nw ne 20-2n-2e	576	3424
Cumberland Prod. Co., B M & I RR 4, sw nw nw nw 21-2n-2e	298	3497
Magnolia, Chitwood 49, ne se se sw 28-2n-2e	965	3492
Ohio, Loyd 31, nw c se 28-2n-2e	1600	3504
Lain O. & G., Dempsey 12, se c ne sw 31-2n-2e	1392	3417
R. E. Angle et al, Zollar 1, se nw nw ne 20-3n-2e	*	3823
Randolph County—		
Egyptian Tie & Timber, Beattie 1, swc sw 11-5s-5w	*	996
Richland County—		
Pure, Pasley Cons. 2, sw nw ne ne 1-4n-9e	248	2900
Wilson 1, cw½ se ne 12-4n-9e	115	2980
Varner Cons. 1, ce½ sw sw 30-5n-10e	121	2905
St. Clair County—		
J. D. Critendon, Anderland 2, se nw nw ne 33-1n-10w	3	569
Wabash County—		
Bander et al, Seibert 2, sw ne ne 4-1n-13w	225	2712
Hayes & Wolfe, Peach 1, se se se 33-2n-13w	8	2738
Mabee Dr. Co., Bump 9, sw sw sw 9-2n-13w	123	2454
Magnolia, Merideth 2, ne sw ne 30-2s-13w	10	2485
Washington County—		
Magnolia, Barczewski 5, sw ne ne 15-3s-3w	20	1265
Wayne County—		
Roach & Voyles, Corkan 2, w½ sw sw 3-2s-7e	280	3287
N. V. Duncan, Inc., Skelton 1, ce½ ne ne 32-2n-8e	551	3039
Pure, Oberecht Cons. 2, cw½ nw nw 9-1n-8e	676	3103
Thomas Cons. 1, w½ se nw	53	3099
White County—		
John Less, Pollard 2, ne ne se 29-3s-9w	385	3426
Sun, Greathouse 4, sw ne nw 4-5s-14w	75	2910
Superior, Greathouse 3, sw nw ne 4-5s-14w	564	2899
Shell, Austin 5, ne se sw 24-6s-8e	97	2537
Lain O. & G., Storms 2, nw ne sw 14-6s-9e	100	2259

Indiana

Crawford County—		
Stoll Ref. Co., Franks 1, n½ nw 14-7n-11e	*	1598
Gibson County—		
Joe Bander et al, Cooper 1, sec nw ne 13-3s-14w	90	2515
Papoose Oil Co., Cooper 5, sw nw sw 13-3s-14w	250	2507
Continental, Kleiderer 2, sw se sw 26-3s-14w	20	2517
Perry County—		
L. Stamp, Huck 1, se ne ne nw 382-6s-2w	*	742
Posey County—		
Hollandsworth & Shirley, Keck Hrs. 1, sw ne ne nw 34-3s-14w	*	2159
Spencer County—		
Hendricks et al, Williamson 1, sw nw sw nw 31-7s-6w	*	904

South Louisiana

Bancroft—		
Republic, Lutcher-Moore 11	50	7525
Bateman Lake—		
Texas, Wax Bayou Co. 3	210	10,900
Bayou Blue—		
Markley & Crosby Dr. Co., Baiste Cooperage Co. 1	¶2.0	1781
Chalkley—		
Shell, Hanszen 7	121	8666
Charenton—		
St. Mary, Hertel B-2-4	414	7246
Cheneyville—		
Richardson, Well 12	390	6595
Darrow—		
Humble, Community B-3	*	9335
Eola—		
Amerada, Ceramí 1	746	8535
Irion 4	*	8583
Marchive 1, (otd 8601 ft)	168	8554
Tubre 1	650	8572
Gillis—		
Fohs, Powers 2, (otd 7062 ft)	100	6950
Union Sulphur, Kaufman 9	264	7488
Mayo-Reeves 3, (otd 6778 ft)	4	6674
Golden Meadows—		
Dayvault, Lea 1	lcn	abnd
Marr & Bristol, Church 1	67	5444
McMurray, Orgeron 1	324	5512
O'Dwyer, LaFourche Realty 3	360	5518
Grand Bay—		
Texas, State-Lookout Pass 3	368	10,070
Grand Lake—		
Superior, State-Grand Lake 10	390	8955
Lafitte—		
Texas, LL&E 15	722	10,160
North Crowley—		
Humble, Stokes 5	211	7272
North Elton—		
W. T. Burton, Calcasieu Bank 1	*	8120
Port Barre—		
McDannald, Sibille 1	*	5852
Pan-American, Haas Hirsch 2, (otd 4907 ft)	*	4764
Texas, Botany Bay 28	666	6100
Quarantine Bay—		
Gulf, Orleans Levee Board 6-A	227	9700
Pure, Yount-Lee 16	517	7765
Sorrento—		
Pan-American, United Lands 18	*	1456
Sulphur—		
Union Sulphur, Fee 868	315	6200
University—		
Sugarfield, Reinken 2	260	6805
Ville Platte—		
Continental, Haas 5, (otd 9310 ft)	170	8924
Vidrine 1, tr. 26	168	9129
West Cote Blanche—		
Texas, State 1	162	3100
West Gueydan—		
Magnolia, Benoit 1	*	7335
West Hackberry—		
Gulf, Fee 14 (otd 6457 ft)	155	6841
Acadia Parish—		
Humble, Atkinson 1, South Crowley area	*	9145
Beauregard Parish—		
Atlantic, Spiers 1	250	8440
Rapides Parish—		
Wheelock, Rushing 1, Whittington area	*	6510
St. Martin Parish—		
Shell, Schwing Lumber Co. 1 Happytown area	*	10,946

North Louisiana

Caddo Parish (Pine Island)—		
Texas Co., Herndon 11, 14-21n-15w.	80	1656
Cullinan 1, 32-21n-15w	40	1566
Stanolind O. & G. Co., Noel Est. 1, 25-21n-15w	35	1550
Sklar Oil Co., Cheshire 1, 32-21n-15w	75	1604
L. M. Calhoun, Tr., Caddo Oil & Mining Co. 2, 12-20n-16w	70	1533
E. O. Mitchell, Fee 1, 12-20n-16w	65	1528
Thomas & Mach, Burton 1, 1-20n-16w	200	1503
Ivan W. Wright, Moore 1, 1-20n-16w	*	1560
Baxter Moody, Muslow 1, 5-20n-15w	100	1563
P. N. McCullough, Rudderdorff 1, 11-20n-16w	5	1609
C. J. Brown, Muslow 3, 5-20n-15w	40	1554
Four Star Oil Co., Muslow 2, 5-20n-15w	200	1550
Hilburn et al, Shreveport Pet. Co. 1, 6-20n-15w	150	1509
Bobby Manziel, Muslow B-3, 6-20n-15w	100	1511
Caddo Parish (Shreveport)—		
C. H. Lyons et al, Ferris 1, 35-18n-14w	400	5585
Bienville Parish (Bisteneau)—		
Arkansas-Louisiana Gas Co., Wimberly 1, 15-16n-10w	¶47.0	5226
DeSoto Parish (Wildcat)—		
J. G. Juan, Frost Lbr. Industries 1, 14-10n-15w	*	3255
LaSalle Parish (Olla)—		
Arkansas Fuel Oil Co., Goodpine B-1, 18-10n-3e	185	2335
Placid Oil Co., La. Cent. Lbr. Co. 16, 36-10n-2e	¶15.0	2423
Goodpine 5, 18-10n-3e	180	2429
La. Cent. Lbr. Co. 10, 7-10n-2e	350	3914
Goodpine 4, 18-10n-3e	85	2442
Morehouse Parish (Monroe)—		
Southern Carbon Co., Tensas Delta 30, 2-21n-4e	¶3.5	2230
Red River Parish (Bull Bayou)—		
J. E. Parham et al, Haynes 1, 20-13n-10w	*	1428
Sabine Parish (Zwolle)—		
Sam Sklar et al, First National Bank 1, 29-8n-12w	*	2660
Tensas Parish (Wildcat)—		
H. L. Hunt, Chicago Mill & Lbr. Co. 1, 30-13n-10e	*	3550
Union Parish (Monroe)—		
Nemours Corp., Hollis 1, 10-21n-3e	¶1.5	2208
Interstate Nat. Gas Co., Fee 97, 2-21n-3e	¶1.5	2216

Kansas

Barton County—		
National Ref. Co. et al, Kraft 1, cw½ nw nw 2-17-11w	*	3400
Stanolind, Werries 3, sw nw se sw 10-20-11w	*	3303
Shell, Kowalsky 2, ne sw ne se 18-20-11w	3000	3291
Butler County—		
Bluejay Oil Co., Clark 1, ne sw ne nw 21-28-4e	30	2495
Adair & Norton, Brondt 9, nwc ne 15-28-7e	25	2765
Brandt 10, ne nw ne 15-28-7e	35	2763
Ellis County—		
Dickey, Henderson "B" 2, cw½ sw sw 6-11-17w	1482	3493
Kollman 3, cn½ nw se 18-11-17w	3000	3366
Republic Nat. Bemis "A" 4, cn½ nw sw 21-11-17w	3000	3477
Cities Service, McCord 3, nw ne ne 26-11-17w	3000	3528
Bay Petroleum, Riddler "A" 3, nw ne ne 12-11-18w	3000	3432
Ellsworth County—		
Beardsmore et al, Talsky 1, ce½ se ne 8-16-10w	3000	3312
Mabee, Kozisek 1, cn½ ne se 18-16-10w	*	3420
Mid-Continent, Matosh 1, cs½ ne se 34-16-10w	311	3295
Continental et al, Rolfs 4, nw sec ne 28-17-8w	3000	3230
Skelly, Janzen 1, cn½ nw se 18-17-9w	3000	3253
McPherson County—		
Shawver, Union Life 5, cs½ sw sw 18-17-1w	895	2712
Westgate-Greenland, Union Life 1, ce½ sw ne 18-17-1w	1905	2672
Ohio, Whitright 2, csw sw 30-19-1w (OTD 2932)	130	2959
Sunray, Lindquist 2, cw½ se nw 29-20-5w	3000	3382
Republic Natural, Knackstedt 4, cs½ nw nw 30-20-5w	120	3333
Reno County—		
Ohio, Sickle 3, sec nw 23-23-4w (OTD 3610)	165	3526
Rice County—		
Continental et al, Johnson 5, ne sw sw 12-18-8w	1047	3237
Transwestern et al, Vokland 3, cw½ sw ne 5-18-10w	3000	3220
Skelly, Sledd 4, cs½ nw sw 27-19-9w	2833	3226
Duwe & Farris, Dippel 1, cn½ nw ne 26-19-10w	347	3276
Continental, Gum 4, cw½ nw se 34-19-10w	419	3309
Westgate-Greenland, Johnson 1, cs½ se se 24-20-6w	3000	3332
Russell County—		
Coralena, Graham 1, cs½ sw se 21-14-13w	30	3013
Sellens 8, se sw se 20-15-13w	20	3302
Cora Trapp 3, nw ne ne 29-15-13w	233	3301
Skelly, Rein 2, cel se sw sw 25-14-14w	1494	2985
Driscoll 2, cel ne nw sw 27-14-14w	1745	3059
Rein 10, cs½ nw se 8-15-13w	891	3027
Stanolind, Krug "A" 9, cel sw ne ne 27-14-14w	1636	3051
Jones & Shelbourne, Kuhnle 4 cn½ sw ne 4-15-12w	803	3216
Cities Service, Esfield 1, nwc 22-15-13w (OTD 3096)	3000	3323
W. I. Southern, Inc., Trapp 5, ne nw ne 29-15-13w	197	3326
Potter et al, Vonfeldt 1, nwc 6-15-14w (OTD 3075)	619	3038
Stafford County—		
Cities Service, Smith "B" 4, nec sw 9-21-11w	*	3434
Stanolind, Sims 6, cw½ nw ne 11-24-11w	3000	3769
Martin 10, cw½ sw nw 14-24-11w	3000	3893
Stevens County—		
United Prod. Co., Miller 1, swc se 24-33-39w	¶15.0	2630

Kentucky

Butler County—		
Vickers & Ross, Heck 1	*	700
Daviess County—		
C. E. Daugherty, Howard 2	25	1241
Dr. Hardy, Bean 8	*	620
Porter Evans et al, Ruby 1	*	1665
Hancock County—		
Jack Cox et al, Waltman 2	*	1022
W. J. Fleschcher, Johnson 1	*	1022
Henderson County—		
Sun Oil et al, Corydon Unit 4	*	2752
Ohio County—		
Eureka Oil Co., Davidson 4	8	296
Henry Scholl, Hale 1	5	525

Mississippi

Holmes County (Wildcat)—		
Hawkins & Howell, Jones 1, 27-15n-1e	*	5010
Smith County (Wildcat)—		
Haynes B. Ownby Dr. Co., School Board 1, 16-2n-9e	*	6500
Warren County (Wildcat)—		
Burden Cummings, Morrissey 1, 8-17n-2e	*	6001
Yazoo County (Tinsley Dome)—		
Slick-Urschel Oil Co., Slick 6, 35-11n-3w	500	4817
Union Prod. Co., Woodruff 7, 13-10n-3w	524	4945
Jennie Stevens 16, 12-10n-3w	480	4929

*Failures; †Junked; ¶Million cu. ft. gas.

United States Well Completions—*Continued*

Michigan

Allegan County—

Company, Well and Location	Init. Prod. Bbls.	Depth
W. C. Mee, Capper Est. 1, nw nw ne 34-1s-15w	*	1233
Regis P. Cook, Reinart 1, nw sw ne 9-3n-13w	*	1734
Sprenger Bros., Brenner 1, sw se ne 10-3n-13w	*	1759
Clapsaddle & Harris, Granger 1, nw ne se 22-3n-13w	*	1929
H. C. Nelson, Peters 1, se se ne 8-4n-14w	300	1480
D. E. Foster, Kok 1, nw sw nw 15-4n-14w	*	1516

Clare County—

Sun Oil, McKenna 1, c sw 23-19n-3w	*	1327
American Prod. Co., Ann Arbor 3, c se 21-18n-5w	¶.50	1551
Taggart Bros., Brown 27, cnw nw 8-20n-6w	*	1730

Isabella County—

Cities Service, Parsell 2, se nw ne 17-16n-3w	381	3753

Kent County—

Welsh Oil Co., Whalen 3, nw ne sw 32-7n-12w	30	1893
James E. Flanigan, McShane 2, nw nw sw 33-7n-12w	150	1857
J. J. McGerry, Inc., Liskiewicz 2, se ne ne 6-6n-12w	10	1904

Montcalm County—

Belvidere Oil Co., Church 1, se sw se 12-12n-6w	¶.50	1310
Skidmore 1, nw sw sw 15-12n-5w	*	1236

Muskegon County—

R. C. Lentz, Tr., Wegg 1, nw sw se 35-9n-16w	*	1807

Ottawa County—

Regal Dutch Pet. Co., Wabeke 1, ne nw nw 12-15n-5w	*	1679
H. H. Gelnig, Van Draght 1, se se sw 22-6n-16w	*	1570
Marshall Bauman, Den Boer 2, se nw 23-7n-13w	400	1879

St. Clair County—

Lee Brown, Maynard 1, se se sw 23-8n-16e	*	1070

Tuscola County—

Milton Steinhaus, Boyce 1, se ne se 23-14n-7e	65	3413

Van Buren County—

Slagel Dr. Co. McConnohie 1, se se nw 21-2s-16w	*	1027
Clapsaddle & Harris, Kopterski 1, sw sw sw 20-1s-14w	*	1302

Montana

Glacier County (Cut Bank)—

Texas Co., Curran 5, cnw se 8-32n-5w	200	3021

Toole County (Kevin-Sunburst)—

G. & A. Oil Co. Goeddertz 15, cel ne se 23-35n-3w	25	1691
C. T. Oien, Engemoen 9, nw ne nw 14-35n-2w	95	1585

New Mexico

Eddy County—

Dixon & Yates, Saunders 3-A, nw sw nw 12-18s-29e	*	2747
T. B. Knox et al, State 1, nwc ne 14-18s-29e	*	2785
Talmadge & Cowell, State 1, ne sw nw 16-18s-29e	20	2661

Eddy County (Wildcats)—

Mac T. Anderson et al, Neeson 1, sw sw nw 4-16s-30e	*	2934
Hadlock & Randall, Lee 1, nw se nw 24-18s-29e	*	2774

Lea County (Eunice)—

Texas Co., State 8-C, c se ne 19-20s-37e	280	3863

Lea County (Arrowhead)—

Continental Oil, State 7-J-2, c nw se 2-22s-36e	2880	3781
Gulf, Mattern 10-E, c se sw 1-22s-36e	1660	3790

Lea County (Hardy)—

Gulf, Owens 2, csw se 34-21s-37e	138	3740

Lea County (Maljamar)—

Green Bay Oil Co., Mitchell 2-A, cse se se 6-17s-32e	25	3980

Lea County (Skelly)—

Gulf, La Munyon 2, c sw nw 29-23s-37e	174	3625
Stampfli & Martin, Giler 3, se nw ne 33-22s-37e	50	3688

Lea County (Vacuum)—

Texas Co., State 1-AB, cw½ nw se 6-18s-35e	321	4710
State 7-R, cnw se 1-18s-34e	1599	4710

Ohio

Athens County—

Gross & McCune, Antle 6	6	419
Fairfield G. Co., Varner 5	¶.60	1210
C. W. Zuzum, Bails Hrs. 1	¶.15	999

Coshocton County—

Kuntz-Hulze, Rine 1	*	3291

Franklin County—

Carl Blacksten et al, Simms 1	*	2903

Guernsey County—

Jewell Co., Robinson 2	3	481

Knox County—

Gas Prod. Co. of Ohio, Jones 1	15	3172

Licking County—

O. P. Spangler et al, Hughes 3	5	730
Dowler O. & G. Co., Holz 2	¶1.50	2669
Wehrle Co., Crawmer 1	¶.95	2325
Ohio Fuel Gas Co., Phillips 1	¶.40	2535
G. T. Shrider et al, Porter 4	¶.07	584

Lorain County—

Wiser Oil Co., Szuces 4	*	246

Medina County—

Thornton Prod. Co., Sanford & Watson F-9	5	397
Sanford & Watson F-10	5	419
Sanford & Watson F-17	5	382
Sanford & Watson F-18	5	389
Hoffman 1	¶.03	501
N. Y. O. & G. Co. et al, Brown Jr. M-6	5	402
Brown Jr. O-4	1	402
Brown Jr. O-5	1	401
Preston Oil Co., Homan 21	*	338
Homan 22	*	335

Meigs County—

Roush Bros., Salser 1	2	1728
Joe Rubin, Snowball 2	*	2990

Morgan County—

Gas Prod. Co., Komaromy 1	17	3800
Shaw et al, Fee 1	2	442
C. Foraker et al, Komaromy 1	*	3875

Noble County—

E. E. Walters et al, Crock 1	1	282
C. W. Rich et al, Craft 1	¶.10	700
Eugene Ward, House 1	*	743

Perry County—

Davis et al, Maddox Hrs. 1	50	3275
Beachman 3	15	3260
L. L. Dittoe et al, Beacham 3	20	3350
Swingle et al, Ricketts 1	5	3213
Preston Oil Co., Trimmer 9	*	3711

Washington County—

E. W. Haas, Kuntz 1	10	999
J. T. Campbell, McMahon 1	5	710
McVay Bros., Armstrong 8	*	775

Wayne County—

Obermiller Bros., Montgomery 1	*	462

Oklahoma

Caddo County—

Phillips, Fletcher 1, sec nw 34-6n-10w	*	3848

Carter County—

Gibson et al, Nertens 3, ne nwc se 20-4s-2w	15	1939
Shell, Tubbi 25, se nw sw nw 24-4s-3w (OTD 1095)	32	1156
Tubbi 27, ne nw sw nw 24-4s-3w (OTD 1130)	26	1189

Comanche County—

Jenkins, Whitehead 3, ne nec 3-1s-13w	*	505

Creek County—

Braver Bros., Airy 1, cse sw 31-16n-7e	¶6	1114
Curtis, Anthis 1, nw nw se ne 2-16n-11e (OTD 2255)	7	2655
Stone Hill, Kelley 1, nc nw sw 22-17n-8e	18	2310
Wright, Fee "A" 8, ne sw sw 19-17n-11e	¶0.3	2413
Sinclair Prairie, Kieffer 28, sw sw ne se 17-17n-12e	12	1533
Link, Mickey 6, nwc sw 33-18n-7e	*	1690
Sidwell, Means 3, swc 25-19n-8e	*	2594
Ferguson Bros., Renfrow 1, sw ne sw 30-19n-8e	*	2775

Grady County—

Sinclair Prairie, Pooler 4A, ce½ ne ne 22-5n-8w	†57.2	4073

Jackson County—

Kerbo et al, Leona 1, sec 31-1n-19w (OTD 2591)	86	2625

Okfuskee County—

Titers, Perryman 1, nwc sw 25-11n-8e	150	3116
Yaokum, Long 1, csw se 34-12n-9e	¶7	3826

Okmulgee County—

Bogie, Rentie 1A, ne nw sw ne 1-13n-14e	*	1316
Dow, Rentie 3-B, se se sw sw 12-14n-14e	18	1064
Elm, Hutchings 28, se nw ne sw 13-14-14e	10	1138
Potter, Grayson 1-A, ce½ ne nw 34-14n-14e	*	1222
Dodge, Herrod 19, sw se se 17-15n-14e	5	843
Reliance, Anthis 8, nwc 26-16n-11e	*	2941
Minchell, Simms 2, ne nw sw 33-16n-11e	12	2070

Osage County—

Alexander et al, 8, ne se nw sw 16-21n-10e	20	2049
Leavel et al, 3, sw nw sw sw 12-23n-11e	*	1526
Sawyer, 24, sw ne nw ne 24-24n-7e	*	775
Mason, 8, nw nwc se 3-24n-12e	5	1547

Pawnee County—

Brewer, Cotten 12, ne nec sw 6-20n-8e	*	2585
Bryan, Zickafoose 4, nw sw ne ne 23-20n-9e	25	1249
Fortner, Pierce 4, sw nw sw se 20-20n-10e	2	1872

Payne County—

Mid-Continent, Johnson 1, cw½ sw se 2-17n-1e	810	4960
Blackwell et al, Shannon 2, ne se sw 24-18n-4e	7	2994

Pontotoc County—

Senora, Cotton 1, sw se sw 13-5n-4e	*	2568
Harwell, Summers 1, sw se se 26-5n-4e	260	2626

Pottawatomie County—

Magnolia, Hilton 1, nwc 22-7n-4e (OTD 4162)	15	4170
Oklahoma Oil Corp., Smith 3, sw nw se 25-7n-4e (OTD 4152)	5	4205
J. F. Smith, Hill 1, cn½ ne ne 10-8n-4e	*	4427
Meazel, Billington 1, se ne ne 26-9n-4e	70	4500
Taber et al, McKinney 1, ce½ se sw 11-10n-4e	*	5088
Pace, Weiss 1, nw sw ne 36-10n-4e	25	4418

Seminole County—

Pure, Strothers "A" 12, se sw sw 26-9n-6e (OTD 4020)	40	4070

Tulsa County—

Cook et al, Horner 3, sw sec 14-17n-12e	*	1893
Minshall, Logsdon 1, cn½ ne ne 2-19n-14e	¶1.00	1243

Wagoner County—

Kenner, Remore 1, sw nw nw 20-17n-15e	*	1896
Daniels, Reed 1, sw nw ne 9-18n-15e	*	1110
French Bros., Mobbs 1, ne nw se 20-18n-17e	10	388
Finefield, Stiel 1, sw se sw 33-18n-18e	*	422
North, Clayton 1, nwc ne 20-19n-15e	*	1180

Pennsylvania

BRADFORD DISTRICT

Ryder Scott Co., fee	5	...
D. E. Quinlan Estate, fee	2	...
George Van Vechten & Son, Farr	3	...
Pine Run Oil Co., 130-1-2-3-4-6 Bing	4	...
Bradford Transit Co., 17 wells	17	...
Forest Oil Corp.	1	...
Forest Oil Corp.	3	...
Niagara Oil Corp.	3	...

Water Intake Wells

N. V. V. Franchot, Mgr., Trustee, Campbell	...	...
Pine Run Oil Co., Bing 130-1-2-3-4-6	...	...
Forest Pet.	...	...
Niagara Oil Corp., 7 wells	...	...

MIDDLE DISTRICT

Floyd A. & Wilbur F. Fleming, Fleming	4	...

Water Intake Wells

Joseph Karl et al, Lot 106	...	...

BUTLER-ARMSTRONG

Fulton et al, Hindman	¶	...
McCullough Bros., Kamerer	*	...

NEW YORK

Allegany County—

Messer Oil Corp., Vosburg farm, Bolivar	5	1243
Victor Oil Co., Whitcomb farm, Wirt	6	1269
Ella M. Murphy Est., Hoover farm, Bolivar	8	1386
Ebenezer Oil Co., Emerson farm, Scio	6	1035
Bradley Prod. Corp., Monder farm, Alma	4	1270
Monder farm, Alma	4	1266
Albert Oil Co., Easton farm, Alma	4	1239
Bohne Bros., Helmhold farm, Willing	5	1312
H. W. Patterson, Milks farm, Scio	5	937
Empire Gas & Fuel Co., Wilson farm, Independence	¶16.	4612

Water Intake Wells

Ebenezer Oil Co., Jerrick farm, Alma	...	1227
Forest Oil Co., Ackerman farm, Bolivar	...	1168
R. B. Moore No. 6, Daniels farm, Bolivar	...	1279
Vossler & Short et al, Quick farm, Alma	...	1544
Otsquago Oil Corp., Pike farm, Alma	...	1380
N. V. V. Franchot, Reddy farm, Alma	...	1435
Brown & McEnroe, Bellamy farm, Alma	...	1182
Homestead Oil Co., Homestead farm, Bolivar	...	1360
Hopkins, Short Bros., Clark farm, Willing	...	1049
Messer Oil Corp., Courtney Hollow farm, Genesee	...	1334
Courtney Hollow farm, Genesee	...	1350
Courtney Hollow farm, Genesee	...	1315

*Failures; †Junked; ¶Million cu. ft. gas.

United States Well Completions—*Continued*

Southwest Pennsylvania

Armstrong County—

Company, Well and Location	Init. Prod. Bbls.	Depth
T. W. Phillips G. & O. Co., Burns 1	¶1.40	1354
Humphrey-Stone-McCall Corp., Heffelfinger 1	¶.28	1448
Peoples Nat. G. Co., Coulter 1	¶.17	1853
Equitable Gas Co., Boyer 1	*	3604

Clarion County—

Owens-Illinois Glass Co., Longwell 1	¶.15	2485

Fayette County—

Greensboro G. Co., Diamond 1	¶.15	2530
Wahler Powers O. & G. Co., Valerio 1	*	2618

Indiana County—

T. W. Phillips G. & O. Co., R. & P. Coal Co. 2	*	3473

North Texas

Archer County (Hull Silk)—

Gulf, Siegel 18	720	3790
Bert Ligon et al, Little 5-A	1560	4378
Ed. Peterson-E. C. DeMontel, Schildknecht 3	936	4325
Pet. Prod. Co., Wilson-McCrory 6	1128	4334
Texas Co., Wilson 41-A	900	3886

Archer County—

N. H. Martin & Sons, Wilson 5	15	1609
Panhandle Ref. Co., Green 9-C	35	1118

Clay County—

Perkins & Cullum, Taylor 7, sec 36	*	1228

Clay County (WC)—

F. H. Gohlke et al, Bunnenberg 1	*	1194

Clay County (Burns-Browning)—

Shell, Davis 1	*	6014

Cooke County—

Bridwell Oil Co., Flusche 5-A	8	1243
Flusche 6-B	118	1186

Cooke County (Walnut Bend)—

Sun Oil, Snuggs 4	520	4949

Jack County—

Big Six Oil Co., Smith 5	129	2355
Maracaibo Oil Expl. Corp., Owens 1	390	3280
Rowan-Nichols Dr. Co., Rankin 1	*	3257
Trentman, Nunnelee & Showers, Owens-Showers 2	98	3305

Jack County (WC)—

B. C. Gilmore et als, Hoefle 1	*	634
Harper-Knappenberger et al, Marley 1	*	3134
H. R. Smith et al, Yates-Brant 1	*	2560

Montague County (Bonita)—

Sinclair Prairie, Howard 2 (pb to 5458 ft)	2152	5852

Montague County (Ringgold)—

British-American O. P. Co., Martin 1	1320	5695

Montague County (Wildcat)—

Walter Gant-Continental, Brown 1	†	7334
Tom Wade et al, McLaughlin 1	*	2981

Wichita County (K-M-A)—

C. O. Davis et al, Jones 3	536	4098
E. C. Oil Co., Burnside 3-A	*	4145
Fain-McGaha Oil Corp., Griffin 17-B	720	3824
W. H. Hammon et al, Mitchell 17	328	3902
Hammon, Hanlon & Buchanan, Fassett-Tuttle 23	488	4023
Hanlon & Buchanan, Fassett-Tuttle 6-G	461	4062
Fassett-Tuttle 16-G	402	4081
Huckelberry & Cline, Banta 1	50	4084

Wichita County—

C. E. Beavers et al, Clark 1	*	1485
King Oil Co., Waggoner Est. 10-R	10	1611
Mogren & Anderson, Mertens 12	*	1015

Wilbarger County (Consolidated)—

J. A. Wood et al, Womack 1	480	4033

Wilbarger County—

Pois & Schulz, Streit 3	*	2034

Young County—

Henry Craig et al, Gatwright 1	*	877
S. D. Glover et al, Johnson 26	9	578
Kleiner-West & H. Y. Oil Co., Benson 1-A	*	942
Moran & Wotola Roy Co., Howard 20	38	916
Howard 21	31	925
Nelson Oil Synd., Blount 1	48	4360
Sparks & Hansen, Hamilton 6	12	903
West & Stanford, Williams 4	5	601
Henry Zweifel et al, Martin 3 (pb to 4140 ft)	¶24.75	5021

Texas Panhandle

Carson County—

Gulf, Cooper 28	310	3146
Texas Co., Quinn 11	357	3176

Gray County—

Magnolia, Saunders 5-B	157	2868
Nabob O&G Co., Morse 6-A, sec 53	*	2970
Skelly Oil, Schafer 108	323	3302

Hutchinson County—

Barnsdall Oil Co., Lewis 10-B	821	3048
J. M. Huber Corp., Carver 1	¶11.1	3151
Phillips, Cockrell 45	129	2974
Shell & Sinclair Prairie, Phillips 1-B	*	3330
Stanolind, Ware 14-C	243	3076
Stekoll Oil Co., Whittenburg 7-C	180	3055

Wheeler County—

El Bar Corp., Noel 15	144	2439

South Texas

SAN ANTONIO DISTRICT

Bastrop County—

R. R. Ogden & C. L. Riddle, Riddle 6 (WC)	*	2245

Burleson County—

H. Y. Barnett, Tr., Giesenschlag 1 (WC) John W. Hollingsworth sur	*	1935

Caldwell County—

Ellmag Oil Corp., Dickerson 5 (Salt Flats)	28	2725
Pope 4 (Salt Flats)	50	2724
Ruthland Oil Co., Stacey 1 (WC) Eason Tyson sur.	*	1595
Wiegand Prod. Corp., Trap Briscoe A-11 (Salt Flats)	40	2715

Frio County—

Texas Atlas Oil Co., McWilliams Bros. & Cory 2 (Pearsall)	900	5649

Guadalupe County—

Diamond Half Oil Corp., McKean 1 (Darst Creek)	20	2480
P. G. Rouse, Lenz 1 (Elm Creek)	*	980
Wellington Oil Co., Mauerman 1 (WC) Joseph De La Baume sur.	*	3648

Kimble County—

Austin Bridge Co., Wilkinson 1 (WC) sec 24	*	832

Medina County—

Great Southern Explor. Co., Muennink (WC) sur 5	*	744
Charles H. Wagener et al, Median Irr. Farms 49-A (Chicon Lake)	6	440
Medina Irr. Farms 1-E (Chicon Lake)	4	397

Williamson County—

H. C. Lefors & Richardson, Kutsehback 1 (WC) sur 115	*	848

CORPUS CHRISTI DISTRICT

Brooks County—

Humble, McGill Bros. 54 (Kelsey)	500	4725

Calhoun County—

Eura B. Oil Co., Traylor 1 (WC) sec 3	*	7507

Colorado County—

Shell Oil, Plow Realty Co. 1 (WC) Obed K. Winn sur.	1250	8339

Dewitt County—

Atlantic Ref., Conwell 1 (WC) blk 3	¶3.5 & 125	8519

Hidalgo County—

Gulf States Oil Co., Cardenas 2 (WC) sh 156	¶20. & 200	8702

Jackson County—

Barnsdall Oil, Lazarus 1 (WC) blk 34	650	5932
Coastal Dr. Co., Mauritz A-1 (Mauritz)	1250	5630
Lonnie Glasscock, Drummond B-3 (West Ranch)	1000	5805
Magnolia, Texas (Cosden) 2 (West Ranch)	1200	5109
West 75-A (West Ranch)	1000	5768
West 77-A (West Ranch)	1000	5124
West 78-A (West Ranch)	1100	5762
West 79-A (West Ranch)	1000	5587
Stanolind, Ranch Co. 7 (West Ranch)	1350	5739

Jim Wells County—

Anderson-Prichard, Mueller 1 (Wade City)	650	4990
Atlantic Ref., Albrecht 1 (Wade City)	500	4939
Coquat & Quinn (Wade City)	350	4930
Rodney Delange, McNeil 9 (Wade City)	550	4954
Eaves Oil Co., Spoetzl 2 (Wade City)	*	1500
Henshaw Bros. Wendt 1 (WC) sh 7	375	4940
Howell Hubble, Whitaker 1 (Premont)	50	2368
H. H. Howell et al, Schroede 2 (Orange Grove)	500	5682
Ike Howeth, Robert Adams B-2 (Alfred)	450	4697
Heyser & Heard, De Garcia 6 (Ben Bolt)	750	5397

Karnes County—

Hewit & Dougherty, Newberry 2 (WC) blk 25	*	3300

Live Oak County—

H. F. Baker, Sanders 2 (WC) Stephen Hays sur.	*	1076
Holland & Smith, Gayle et al 1-A (White Creek)	155	1528
H. R. Quinn & E. J. Biscomp, Stolze 1 (WC) sur 31	*	2018
Sinclair Prairie, Hamilton 1 (WC) sur 119	*	4514

Nueces County—

Magnolia, Johnsone 3 (S. Clara Driscoll)	350	5179
Phillips Petr., Driscoll 2 (Clara Driscoll)	450	5995
Stanolind, Parr 4 (Minnie Bock)	250	5826
Sinclair Prairie, Texas 1-B (E. White Point)	350	5634
Texas 2-B (E. White Point)	500	5637
Southern Minerals Corp., Richard King 1-C (King-Bentonville)	*	6195
W. R. R. Oil Co. Texas 3 (973) (E. White Point)	500	5635

Refugio County—

Coronado Corp., Rooke 2 (GI) (La Rosa)	¶20. & 200	5847
Norsworthy Prod. Co., Holeman 1 (WC) Michael Riley sur.	¶3	6509
Quintana Petr. Corp., Williams A-22 (Tomoconnor)	1500	5925

San Patricio County—

Plymouth Oil Co., Solar Oil Co. & Ficke 10 (E. White Point)	500	5680
Plymouth Oil Co., Toups 1 (E. White Point)	*	6006
Puertora Oil Co., Losoya 1 (DD 20) (McCampbell)	250	7325
Republic Natural Gas, Rachal 26 (E. White Point)	250	5900
Southern Minerals Corp., Carlock 5 (McCampbell)	¶5. & 50	8750
McCampbell Est 6 (McCampbell)	250	7140

Victoria County—

British American, Warden 1-B (WC) Edward McDonough sur.	*	5707
Colton & Colton, Edwin Fimble D-1 (WC) sur 3	*	4336
Gulf Oil, Traylor B-36 (Heyser)	*	5503
George E. Smith, Reimann 1 (WC) Manuel Zepeda sur.	*	3305
Magnolia, Simon 1 (Victoria)	25	3054
Maryland Oil Co. et al, Kolle 1 (WC) Ab-103	*	3510

LAREDO DISTRICT

Duval County—

Continental Oil, Driscoll 50-A (Driscoll)	320	3360
Cox & Hamon & Gormon-Yoakam, Hoffman 7 (109) (Tarancahuas)	175	2081
Hoffman 5 (109) (Tarancahuas)	180	2079
J. W. Gorman & C. E. Yoakam, D. C. R. C. 1 (WC) sur 193	*	2306
Humble, D. C. R. C. F-14 (Cedro Hill)	*	1450
D. C. R. C. F-17 (Cedro Hill)	14	1437
H. J. Porter, Yates 2 (WC) sur 323	*	3553
Taylor Ref. Co. & R. A. Thomaston, Parr 1 (WC) sec 298	¶1. & 23	5710

Jim Hogg County—

Walter Achning & Charles Daubert, Wood et al (WC) sur 82	175	2614
Humble, King-Colorado 12 (Colorado)	300	3029
Atwood 13 (Colorado)	325	3088
R. A. Welch, Lopez et al 1 (WC) sur 266	*	3514
Lopez et al 2 (WC) sur 266	*	3514

Starr County—

George R. Boyle et al, Standard Trust Co. 1 (WC) por 9192	250	3505
W. R. Davis Co., Inc., Slick Est. 7-A (Rincon)	450	4335
Slick Est. B-25 (Rincon)	325	4302
Denzil Oil Co. (Glen Harroun), Seabury 1 (WC) por 80	25	1349
Humble, Montalvo 8 (Sun)	200	4872
Magnolia, Francisco B. Guerra 3 (WC) Santa Cruz gr.	*	6640
Moss, Owen & Bishop, Hinojosa et al 5 (Ricaby)	52½	1288
Sun Oil, Speer B-2 (Sun)	650	4998
Y. & B. Oil Co. Starr County Cattle Co. 1 (Barbacoas)	*	40

Webb County—

Bridwell Employees Oil Co., Adami 2-B (Adami)	*	1517
Cartter & Rubsamen, Houston Oil Co. 13 (Carolina-Texas)	¶23. & 50	5104
Glenda Oil Co., Saldivarl (WC) sur 657	*	1640
Harvey & Henderson, Benavides 6 (Volpe)	78	2467
O. W. Killam, Bruni Est. 2 (Glen)	56	2186
Magnolia, Benavides 3 (West Cole)	28	2349
Black-Garcia 7 (Aviators)	*	2169
Volpe-Benavides 29-A (Volpe)	65	2460
Volpe-Benavides 35 (Volpe)	32	2347
W. C. McBride, Pedro Leal 2 (WC) sur 461	¶5.	3117

Zapata County—

Interstate Minerals, Rufino Lopez 36 (Mirando Valley)	*	1759
Kleiner & Hill, Gutierrez 16 (Escobas)	4½	1267
J. P. Martin, Serajio Vela 1 (WC) sh 2	*	3511
Ed Mathis, Martinez 96-B (Charco-Redondo)	*	1510
W. H. Holland (Mayfair Oil Corp.), Cuellar Hrs 1 (Cuellar)	*	1717

Texas Gulf Coast

Anahuac—

Humble, Broussard 13	698	7080

Batson—

Atlantic, Cruse 2	330	5290
Ada Belle, Texas Co. 283	4	410
Texas Co. 284	20	531

Caplen—

Sun, Zinn & Forman 5	194	7780

Clear Lake—

Humble, West Fee 41-C	265	5905
West Fee C-44	144	5899
Hutcheson 8	96	5839

[*Continued on next page*]

United States Well Completions—*Continued*

TEXAS GULF COAST—Continued

Company, Well and Location	Init. Prod. Bbls.	Depth
Dickinson—		
Three Bee, Schroeder 1 (wo)	100	8093
Fairbanks—		
Amerada, Foley 22	133	6842
Gillock—		
Pure, Maco-Stewart 6	128	8330
Lovell's Lake—		
Humble, Broussard 15	*	6803
Sandy Point—		
J. A. Fite, Fee 3 (wo)	19	...
Fee 1	43	6566
Segno—		
Gulf, Wing 33	135	8175
Sourlake—		
Ebberts & Hebert, Fee 1	31	2100
South Houston—		
T. A. Carlton, Williams 2	91	3915
South Thompsons—		
Gulf, Wolters 13	582	5447
Wolters 31-Y	402	4362
West Columbia—		
Texas, Abrams 38	298	5567
Withers—		
Texas, Pierce Est. B-52	95	5390
Chambers County—		
Humble, Barrow 1, South Cotton Lake area	*	8865
Walker County—		
E. J. Deu Pree, Texas Long Leaf Lbr. Co. 1	*	3398

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Andrews County (Means)—		
Humble, Means 81	114	4525
Crane County (Jordan)—		
Snowden-McSweeney Co., University 7	†	2455
Crockett County (Wildcat)—		
Moore Explo. Co.-Olson Dr. Co., Noelke 1	130	2371
Ector County (Foster)—		
Barnsdall Oil Co., Witcher 6	1171	4170
Broderick & Calvert, Witcher 23	689	4160
Ector County (Goldsmith)—		
M. A. Grisham et al, Cowden 1 (pb to 4516 ft)	283	6090
Phillips Pet-Pure Oil, Cowden 90	1901	4147
Ector County (Jordan)—		
Shell, University 8-E	1211	3650
Ector County (North Cowden)—		
Cities Service, Rhodes 3	974	4200
Wight 3-B	1280	4220
Sinclair Prairie, Holt 1	145	4266
Gaines County (Seminole)—		
H. W. Bass et al, Austin-Standard 1	571	5249
Magnolia & Atlantic, H. & J. 1-221	887	5243
H. & J. 6-265	638	5292
Hockley County (Slaughter)—		
Honolulu Oil Corp., Slaughter 7-21	745	5000
Pecos County (Apco)—		
Childress Roy. Co., Masterson 1-B	747	4724
Pecos County (Pecos Valley)—		
Superior Oil Corp., Iowa Realty Co. 10	80	1648
Pecos County (Tobarg)—		
Cardinal Oil Co., Tippett-Kirby 58-E	28	464
A. J. Rife et al, Tippett-Conoco 6	31	494
Scurry County (Sharon)—		
D. & R. Oil Co., McClure 6	194	2411
Scurry County—		
B. R. S. Oil Co., Chapman 2	128	1744
Sutton County (Wildcat)—		
Craig & Scoggins, Holman 1	*	567
Ward County—		
Mrs. E. S. Briant et al, Jones 6	116	2589
Gulf, Hutchings 141	¶8.3	2545
Hutchings 142	211	2727
O'Brien 135	*	3166
Texas Co., University 3-E	1636	2700
Winkler County (Henderson)—		
Stanolind-Westbrook-Thompson, Hendrick 5-T-88-G	146	3030
Yoakum County (Wasson)—		
Aloco Oil Co., Futch-Texaco 3	279	5270
Miller-Texaco 3-B	970	5209
Walker-Texaco 3	1049	5271
Willard-Texaco 8-B	637	5245
Don Danvers et al, Allen 1	357	5248
Honolulu Oil Corp., Wilder 12-804	1830	5130
Humble, Abilene State Bank 5	988	5085
Randall 7	494	5142
Mabee O. & G. Co., Willard 3-B	1420	5180
Magnolia, Mahoney 16	909	5210
Osage Dr. Co., Willard-Nelson 1	751	5167
Plymouth Oil Co., Bennett 2-D	106	5239
Shell, Baumgart 15-C	1702	5175

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Callahan County—		
W. J. Murray et al, Evans 6	*	2160
Callahan County (Wildcats)—		
E. Johnson et al, Hughes 3	*	894
Redmond et al, Moore 1	*	1955
Coleman County—		
States Oil Corp., Morris 2	240	3613
Comanche County—		
L. H. Choate et al, Brashear 1	*	589
Jones County (Wildcat)—		
Fain-McGaha Oil Corp.-Ungren & Frazier, Swenson 1	*	2410
Jones County—		
Condor Pet. Co., Sayles 27	328	1944
T. D. Humphrey et al, Triplett 2	20	2309
King Oil Co., Carter 14	*	1940
Lewis Prod. Co., Sayles 2-D	389	1933
W. B. Omohundro et al, Adams 4	244	1907
Palo Pinto County—		
Echols et al, Carter 1	*	2393
Shackelford County—		
Gallagher & Ratliff, Lynch 1	*	320
N. Grossenbacher et al, Hickman 6	23	671
J. L. Hart et al, Sanders 9	41	586
Sanders 10	*	600
Humble, McCown 1	112	3183
Roark et al, Hickman 6	15	667
Roeser-Pendleton & Continental, Cook 8-A-113	251	1589
A. P. Schkade et al, Fee 1	¶1.5	535
Trammell et al, Gillespie 1	1	383
Shackelford County (Wildcat)—		
Palmer et al, Daniels 1	*	774
Stephens County—		
Wittmer O. & G. Prop., et al, Loving 3	46	3575

East Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Longview Area—		
B. F. Phillips et al, Cannon 2	1200	3606
Texas Co., Boles 7 (25-ac)	3000	3581
Anderson County (Cayuga)—		
Carter-Gragg Oil Co., McMahon 2	204	4013
Anderson County (Long Lake)—		
Alex McCutchin et al, Reagan 1	85	5381
Anderson County (Wildcat)—		
Phillips Dr. Co., Hanks 1	*	4916
Franklin County (Talco)—		
Texas Co., Barker 13 (468.39-ac)	293	4278
Freestone County (Wortham)—		
McNeil Pet. Co., Simmons 1	44	2940
Rusk County (Wildcat)—		
J. Z. Werby et al, McMillan-Humble 1	*	4140
Titus County (Talco)—		
Adams & Lyles, Mt. Pleasant Bank 1-A	527	4327

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Boone County—		
Pond Fork O. & G. Co., Fee 5	¶.15	2881
Owens-Libby-Owens, Allen & Pryor 26	¶.14	2298
Braxton County—		
Pitts. & W. Va. Gas Co., Fear 1	¶.46	1647
Boggs 7732	¶	1542
Cabel County—		
W. C. Kingery, Leitner 1	¶.13	2937
Calhoun County—		
South Penn Nat. G. Co., Garrett 4	5	2260
Brannon 5	¶.35	2078
Virginian G. & O. Corp., Hathaway 2	4	2236
W. H. Bickel, Belford 1	¶.17	1882
Clay County—		
Thompson Gas Co., Thompson Land & Coal Co. T-43	¶.54	925
Thompson Land & Coal Co. T-44	¶.44	2041
Kanawha County—		
United Carbon Co., Woodall et al 825	¶4.80	4837
Scott 824	¶4.36	5084
Lincoln County—		
Harvard G. Co., Lincoln Mineral & Land Co. 7	¶1.00	3685
Pleasants County—		
Columbian Carbon Co., Hammett et al 1	20	2230
Wayne County—		
Thompson Bros., County Poor Farm 1	¶.18	3127
Wetzel County—		
Hope Nat. G. Co., Shafer 1	¶8.00	2920

*Failures; †Junked; ¶Million cu. ft. gas.

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by M. H. HADDOCK

Principal, The Mining and Technical Institute, Leicester, England

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CHAPTER HEADINGS

1. Deviation and Its Causes
2. Auxiliary Registrations in Borehole Surveys
3. Instrumental Survey of Boreholes
4. Fluid Methods of Surveying Boreholes
5. Core Orientation
6. Compass and Plumb-Bob Methods
7. Pendulum Methods
8. Photographic Methods
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WILDCAT REPORT
New Starts and Completions

ALABAMA

FIRST REPORTS

Walker County—Champlin Oil & Ref. Co.'s Galloway Coal Co. 1, sec 12-13s-9w, 3 mi nw of Carbon Hill, rig.

Marion County—Seaboard Oil Co.'s Clark A-1, se sw 28-11s-14w, 450 ft w of abnd J. F. Clark 1, sp.

COMPLETION

Marion County—Seaboard Oil Co.'s Clark 1 (Easton 1), se sw 28-11s-14w, abnd 645 ft, drilled into cavity.

ARKANSAS

COMPLETIONS

LaFayette County—Atlantic Ref. Co.'s Bodcaw Lbr. Co. 1, cne sw 29-17-23, elev 273 ft, Midway 1003 ft, Arkadelphia 1595 ft, Nacatoch 1751 ft, Buck Range 2630 ft, chalk 2160-2455 ft, Tokio 2865 ft, red beds 3250 ft, Paluxy sand 3354 ft, massive anhydrite 4187-4490 ft, Travis Peak 5460 ft, Lower Marine 6765 ft, Buckner 8895 ft, Smackover lime 9039 ft, gas/oil contact 9122 ft, water level 9205 ft, completed flowing 10 bbls distillate per hr through 11/64-in tbg ch, td 9221 ft.

Miller County—Standard Oil Co. of La.'s Sturgis 1, cnw se 1-17-27, elev 346 ft, Midway 1182 ft, Nacatoch 1598 ft, Saratoga 2106 ft, Annona chalk 2365-2516 ft, Paluxy 3586-3606 ft, anhydrite 4810 ft, massive anhydrite 4971-5130 ft, Gloyd 5381 ft, Travis Peak 6610 ft, drilled to 9550 ft, pb & comp after perf csg at 3576-3606 ft in Paluxy, washed in making 22 bbls 30-gr oil per hr on open ch, 30 percent wash water, later gauged 100 bbls oil in 24 hours on ⅛-in ch.

CALIFORNIA

FIRST REPORTS

Kern County—General Pet. Corp.'s Twisselman 1, sec 31-27-19, lcn, Shale Hills area.

San Mateo County—Ra-Lite Pet. Inc.'s Bell 1, sec 16-7-4, rig, La Honda area.

Santa Barbara County—Tide Water's Souza 1, sec 12-6-33, lcn, Santa Rita Hills area.

COMPLETIONS

Kern County—General Pet. Corp.'s BVA 1, sec 1-32-24; td 11,886 ft, plugged to 4772 ft, abnd, Buena Vista area. Freda G. Oil Corp.'s Laymance 3, sec 20-30-22, td 1245 ft, 75 bbls daily, 16.4-gravity, cut 2.5 percent, McKittrick area. Hall-Baker Co.'s Villard 1, sec 18-26-28; td 1967 ft, gray Vedder sand 1876 ft, abnd, Mount Poso area. Tide Water's West Slope 1, sec 20-24-18, td 2087 ft, 40 bbls 16.4-gravity, cut 3.4 percent, Pyramid Hills area.

Los Angeles County—United Oil Co.'s Schimming 1, sec 25-4-11, td 9310 ft, abnd, Stanton area.

Tulare County—Standard's Rideout 1, sec 34-24-23, td 2529 ft, 478,000 cu ft, dry gas, Trico area.

KANSAS

FIRST REPORTS

Barton County—Robertson et al's Miller 1, cwl sw ne 4-16-14w, dr. Finston & Co. et al's Pichner 1, cel ne sw 24-16-11w, rur.

Butler County—Murfin et al's Hall 1, sec sw 7-29-7e, lcn.

Cowley County—Trees Oil Co.'s Orr 1, nwc ne 17-30-4e, rig.

Jefferson County—Davis Gas Corp.'s Julien 1, swc nw 9-11-19e, mach.

Russell County—Pryor & Lockhart et al's Davidson 1, ce½ ne nw 12-15-11w, dr.

COMPLETIONS

Barton County—C. L. Carlock et al's Jenke 1, cw½ nw nw 7-18-11w, 5 mi w Bloomer pool, Topeka 2670 ft, Lansing 3127 ft, Sooy 3400 ft, Arbuckle 3417 ft, abnd 3460 ft. Champlin Ref. Co.'s Fiege 1, ce½ se ne 22-20-11w, s of Silica pool, Lansing 3070 ft, Sooy 3308 ft, Arbuckle 3403 ft, abnd 3415 ft. Bartlett & Crum's Hulme 1, ce½ se sw 9-20-12w, Topeka 2778 ft, Lansing 3115 ft, Sooy 3413 ft, Arbuckle 3435 ft, abnd 3445 ft.

Butler County—Wixson et al's Bolin 3, se sw ne 1-27-6e, 2½ mi ne Reynolds-Shaffer pool, Mississippi 2768 ft, base Mississippi 3030 ft, Simpson sd 3072 ft, hfw 3092-96 ft, abnd 3105 ft.

Douglas County—Kerlyn Oil Co.'s Wise 1, cse sw 28-12-20e, e Lawrence, Mississippi 1185 ft, abnd 1588 ft.

Ellsworth County—Aylward Prod. Co. et al's Haska 1, ce½ se se 6-16-10w, 1 mi w Stoltenberg pool, Arbuckle 3273½ ft, td 3292 ft, 3200 gals acid, 3000 bbls, 42.5 gr. Sharon Drg. Co. et al's Novotny 1, cn½ nw ne 32-16-10w, 2 mi s Stoltenberg pool, Arbuckle 3292 ft, 3000 gals acid, abnd 3318 ft.

Russell County—Cities Service Oil Co.'s Rochester Trust 1, sec ne 11-13-15w, 2½ mi n N. Atherton pool, Arbuckle 3238 ft, water 3254-58 ft, abnd 3258 ft.

SOUTH LOUISIANA

FIRST REPORTS

Acadia Parish—Vincent & Welch's McManus 1, Trilby area, sec 21-7s-1w, testing 3500 ft.

Plaquemines Parish—Gulf Ref. Co.'s State-Black Bay 1, Black Bay area, 11,830 ft n and 11,480 ft e SW/c 17s-17e, lcn.

St. Martin Parish—Rice Dr. Co.'s Dupuis 1, Bayou Vermilion area, sec 46-9s-5e, dr 2100 ft. Superior's Iowa-St. Martin 1, Bayou Bouillon area, sec 25-9s-8e, lcn.

COMPLETIONS

Acadia Parish—Humble's Atkinson 1, South Crowley area, abnd 9145 ft.

Beauregard Parish—Atlantic's Spiers 1, 1300 ft sw discovery Neale fld, flwg 250 bbls daily, 8440 ft.

Rapides Parish—Wheelock & Collin's Rushing 1, Whittington area, sec 1-2n-13w, Sparta 4502 ft, Wilcox 5837 ft, abnd 6510 ft.

St. Martin Parish—Shell's Schwing Lumber Co. 1, Happytown area, abnd 10,946 ft.

NORTH LOUISIANA

COMPLETIONS

DeSoto Parish—J. G. Juan's Frost Lbr. Industries 1, se sw 14-10n-15w, elev 170 ft, chalk 1777-1912 ft, Austin chalk 2761-2856 ft, Eagle Ford 2856-2910 ft, Georgetown lime 2910 ft, gas sand 3147-51 ft, salt water, abnd with show oil, 3255 ft.

Tensas Parish—H. L. Hunt's Chicago Mill & Lbr. Co. 1, cnw nw 30-13n-10e, elev 69 ft, abnd 3550 ft.

MICHIGAN

FIRST REPORTS

Allegan County—Fortney Oil Co.'s Minegar 1, ne sw se 24-3n-14w, rig.

Berrien County—Lakeland Oil Corp.'s Aubil 1, sw nw ne 5-6s-17w, lcn.

Clare County—Taggart Bros. Inc.'s State 28, cs½ nw se 8-19n-6w, dr.

Missaukee County—D. E. Hughes' Heeringa 1, ce½ se se 21-21n-8w, dr. Century O. & G. Co.'s Richmond 1, 11-22n-8w, lcn.

Muskegon County—Voorhees Dr. Co.'s Cussen 1, sw sw nw 5-12n-16w, dr.

Oakland County—Wicklund Dev. Co.'s Smith 1, sw se se 21-1n-7e, dr.

COMPLETIONS

Allegan County—W. C. Mee's Capper Estate 1, nw nw ne 34-1s-15w, Traverse 1168 ft, abnd 1233 ft. Clapsaddle & Harris' Granger 1, nw ne se 22-3n-13w, Traverse 1769 ft, abnd 1829 ft. H. C. Nelson's Peters 1, se se ne 8-4n-14w, Traverse 1477 ft, td 1480 ft, 300 bbls natural, discovery.

Clare County—Taggart Bros. Inc.'s Brown 27, nw nw 8-20n-6w, abnd 1730 ft.

Muskegon County—Robert C. Lentz, Tr.'s Wegg 1, nw sw se 35-9n-16w, Traverse 1707 ft, abnd 1807 ft.

Ottawa County—Regal Dutch Pet. Co.'s Wabeke 1, ne nw nw 12-5n-15w, Traverse 1577 ft, abnd 1679 ft. H. H. Heinig's Van Draght 1, se se sw 22-6n-16w, Traverse 1480 ft, abnd 1570 ft.

St. Clair County—Lee Brown's Maynard 1, se se sw 23-8n-16e, abnd 1070 ft.

Van Buren County—Clapsaddle & Harris' Kopterski 1, sw sw sw 20-1s-14w, Traverse 1243 ft, abnd 1302 ft.

MISSISSIPPI

FIRST REPORTS

Hinds County—Mrs. S. O. Thompson's Catchings 1, sec 22-5n-1w, pits.

Scott County—E. L. Martin's Newell Mineral Lease Co. A-1, nec 5-6n-7e, mat.

COMPLETIONS

Holmes County—Hawkins & Howell's (formerly A. C. Varner) Jones 1, lot 8, sec 27-15n-1e, elev 164 ft, chalk 3740 ft, abnd 5010 ft.

Smith County—Haynes B. Dwnby Dr. Co.'s School Board 1, ne sw 16-2n-9e, elev 381 ft, Wilcox 1800 ft, chalk 4634 ft, electric log, abnd 6500 ft, water sand.

Warren County—Burden Cummings' Morrissey 1, cne 8-17n-2e, elev 104 ft, Jackson 130 ft, Claiborne 540 ft, Cane River 2040 ft, Wilcox 2740 ft, Midway 4490 ft, Eutaw 4860 ft, Tuscaloosa (Woodbine) 5340 ft, abnd 6001 ft, red shale.

MISSOURI

FIRST REPORT

Holt County—Tedlock & Kilby et al's Browning 1, swc 22-62n-39w, lcn.

NEBRASKA

FIRST REPORT

Nemaha County—Sonken-Galamba et al's Ord 1, c nw sw 8-5n-14e, dr.

OKLAHOMA

FIRST REPORTS

Caddo County—Ray Stephens' Lankford 1, sec nw 6-6n-9w, lcn.

Garvin County—Troup, Moore et al's Bowie 1, nw ne se 3-4n-3e, dr.

Kiowa County—Curtis et al's Hunsinger 1, nw sw se 17-5n-17w, dr.

COMPLETIONS

Kingfisher County—Olson Drg. Co. et al's Geis 1, cne sw 15-18n-9w, 5 mi n Loyal, otd 8507 ft, first Wilcox sand 9265-74 ft, second Wilcox 9316 ft, abnd 9404½ ft.

Kiowa County—Carl Carter's Hinton 1, sec 1-7n-17w, Komalty area, conglomerate 1584-88 ft, abnd 2764 ft.

McIntosh County—Phillips' Blankenship 1, csw nw 33-10n-13e, 7 mi e Dustin gas pool, first Wilcox 3848 ft, abnd 3911 ft.

Payne County—Devonian Oil Co.'s Scott 1-A, sec ne 19-18n-5e, between March and N. March pools, Misener 3906 ft, Sylvan 3907 ft, Viola 3937 ft, Dense 3967 ft, Dolomite 3982 ft, first Wilcox 3991-95 ft, Marshall zone 3995 ft, second Wilcox 4024 ft, abnd 4044 ft.

Seminole County—Culver & Shepherd's Burton-Swan 2, sw se sw 3-5n-5e, new horizon in South Konawa pool, Viola 2825 ft, td 2906 ft, 1000 gals acid, 10 bbls.

NEW MEXICO

COMPLETIONS

Eddy County—Mac T. Anderson et al's Neeson 1, swc nw 4-16s-30e, elev 3844 ft, abnd 2934 ft. Hadlock & Randall's Lee 1, nw se nw 24-18s-29e, elev 3449 ft, salt series 313-980 ft, abnd 2774 ft.

SOUTH TEXAS

FIRST REPORTS

Caldwell County—Wiegand Bros.' Hill 1, 137-ac tr, John D. Rains sur, 1½ mi ne & on trend with Salt Flats fld, mir.

Jim Hogg County—Patel Drillers & C. B. Peters' Gutierrez 1, blk 51, sur 579, El Peyote

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Jim Wells County—Henderson Coquat's Lagging 1, s 62.8-ac tr 6, F. S. Schleicher subd, George H. Reynolds sur 4, on lse acquired fr R. A. Davis, 3500 ft w southern tip Wade City fld, lcn. Hewit & Dougherty's Carver 1, blk 9, Gulf Coast Farming & Trucking Land subd., I&GN sur 176, ab-245, Sinclair-Prairie Farmout, 1 mi sw Wade City fld, ru.

McMullen County—A. Van Dresar's Brown 3, R. H. Brown sur 54, 1350 ft se No. 1, 8½ mi w Whitsett, lcn.

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Nueces County—Forest Dev. Corp.'s Merritt 1, E½ L. I. Mfg. & Canal Co sur 160, ab-614, near Southern Minerals Hellman 1, 3 mi w Baldwin fld, Magnolia farmout, 10-inch csg 1192 ft, td 1192 ft, woc. Humble's Texas 1-B, E. L. Dennis sur 706, lcn. Texas 2-B, E. L. Dennis sur 706, lcn. Fred W. Shield's Moore Est. 1, Dolores I&A Co. sur 143, 3 mi sw Baldwin fld, lcn.

Starr County—A. L. Bone et al's Garcia 3, sh 7-B, por 71, 6-inch csg 372 ft, sd 388-92 ft, td 398 ft, bailing. T. E. Stephens' Guerra 1, sh 253, por 69, 14 mi nw Roma, n of old Empire well, ele. 495 ft, 8½-inch csg 110 ft, sd/oo 440-45 ft, dr below 1550 ft.

Victoria County—John G. Mayo, Inc.'s Goldman 1, 955-ac tr, Valentin Garcia gr, ab-45, 2½ mi se Inez, mir, Pacific Irwin O.&G. Co.'s Keeran 1-B, Martin De Leon gr, ab-74, on 800-ac farmout fr Union Oil of Calif, 12 mi s Inez just s Aguila creek, dr 4665 ft.

Webb County—Fred P. Schwab's Billings Est. 1, n 240-ac of s 580-ac, sec 42, CCSD & RGNG sur, blk 1, Shell farmout, lcn.

Williamson County—J. C. Jackson & A. A. Z zinia's Whittliff 1, 550 ft s Brushy Creek, 250-ac tr, W. Lancy sur, lcn.

COMPLETIONS

Bastrop County—R. R. Ogden & C. L. Riddle's Riddle 6, 400-ac tr, James B. Blalock sur, 6500 ft n Riddle prod, abnd 2245 ft.

Burleson County—H. Y. Barnett, Trustee's Giesenschlag 1, John W. Hollingsworthy sur, 4 mi se Tunis, abnd 1935 ft.

DeWitt County—Atlantic Ref. Co.'s Conwell 1, 120.86-ac, blk 3, Chas. Lockhart sur, 1½ mi w Thomaston, Myersville area, 5½-inch csg 8291 ft, Wilcox 7778-7832 ft, td 8519 ft, comp for 3,000,000 cu ft gas & 125 bbls daily.

Duval County—H. J. Porter's Yates 2, NE¼ J. Poitevent sur 323, 5½ mi e Seven Sisters fld, Pettus 3441 ft, dst 3440-51 rec sw, abnd 3553 ft. Taylor Ref. Co. & R. A. Thomaston's Parr 1, 80-ac lse, sec 298, 10 mi nw San Diego, blk 3, 2800 ft ne fld, td 5710 ft, comp flwd 26 bbls dist, 10 bbls sw 9/65-inch ch, perf 4491-94 ft with 9 shots, making considerable gas.

Hidalgo County—Gulf States Oil Co.'s Cardenas 2, sh 156, San Salvador Del Tule gr, 3500 ft ne discovery, td 8702 ft, comp 20,000,000 cu ft gas, 200 bbls, ¼-inch ch, perf 8174-82 ft with 17 shots & 7315-20 & 7322-50 ft with 36 shots.

Jackson County—Barnsdall Oil Co.'s Lazarus 1, 177.09-ac tr, blk 34, Clement subd, Stephen F. Austin sur, ab-5, ¼ mi e ne/cor Lolita townsite, 7000 ft w discovery, td 5932½ ft, comp pot 165 bbls 7/64-inch ch, perf 5924-29 ft with 20 shots.

Jim Hogg County—Walter Achning & Charles Daubert's Wood et al 1, blk 11, sur 82, ¾ mi w Randado fld, td 2614 ft, comp 175 bbls, 5/16-inch ch. R. A. Welch's Lopez et al 2, sur 266, 697.6-ac tr, 1 mi s Colorado fld, 1¼ mi n Cuevitas fld, 2500 ft e 1, abnd 3514 ft.

Karnes County—Hewit & Dougherty's Newberry 2, blk 25, Carlos Martinez gr, 800 ft nw Echols 1, abnd 3300 ft.

Starr County—Denzil Oil Co.'s (Glen Harroun) Seabury 1, blk 6, sh 46, por 80, Juris. of Camargo, 6 mi n Rio Grande City, td 1349 ft, comp 25 bbls on pump.

Webb County—Glenda Oil Co.'s Saldivar 1, blk 5, Eugene Garner subd of Reynosa pasture, sur 657, J. V. Borrego gr, 18 mi se Laredo, 12 mi sw Aguilaris, abnd 1640 ft. W. C. McBride, Inc.'s Leal 2, NE¼ sur 461, 8 mi n Bruni, 2½ mi w Cole fld, td 3117 ft, comp for 5,000,000 cu ft gas, 3/16-inch ch, perf 2525-29 ft with 24 shots.

WEST TEXAS

FIRST REPORTS

Culberson County—Cecil Cothrun & Lloyd Woods' Casey-Rounsaville 1, c sw PSL sec 7, blk 104, mach for Delaware test.

Sutton County—Dominion Oil Co.'s G. S. Allison 1, near se sw ne TW&NG sec 91, blk 9, rig for Ordovician test.

Terry County—Ray A. Albaugh et al's Brownfield 1, c nw D&W Ry. sec 49, blk T, lcn.

COMPLETIONS

Crockett County—Moore Explo. Co.-Olson Dr. Co.'s Noelke 1, c nw se HE&WT sec 10, blk GG, elev 2720 ft, Cowden anhydrite 1046 ft, Yates 1225 ft, solid lime 2085 ft, used 3175 gals acid 2106-2371 ft, pump 130 bbls 27-4-gr initial.

Sutton County—Craig & Scoggins' Holman 1, sw se ne CCSD&RGNG sec 25, abnd 567 ft.

WEST CENTRAL TEXAS

FIRST REPORTS

Callahan County—E. E. Thate et al's Fee 1, sec 203, Victoria CSL sur, lcn. C. D. Hagerty et al's Windham 1, sw nw se GH&H sec 154, blk 3, machine.

Hamilton County—Gunther & Smith's Thompson 1, R. Kennedy sur, sp & sd. Hensley & Watson's Manning 1, Agapo Gathan sur, rur for 4500-ft test.

Jones County—Jones-Stasney-Groover & Rose's Humphrey 1-a, se se sw BBB&C sec 192, lcn.

COMPLETIONS

Callahan County—E. Johnson et al's Hughes 3, ne ne BBB&C sec 127, abnd 894 ft. C. A. Redmond et al's Moore 1, ne¼ S. P. Ry. sec 9, blk 6, abnd 1955 ft.

Jones County—Fain-McGaha Oil Corp.-Ungren & Frazier's Swemson 1, nwc of 89.6-ac tract, sec 245, J. McGrew sur A-266, abnd 2410 ft.

Shackelford County—F. N. Palmer et al, Daniels 1, ne E. T. Ry. sec 16, abnd 774 ft.

TEXAS GULF COAST

FIRST REPORT

Walker County—E. J. Deu Pree's Texas Long Leaf Lumber Company 3, Mary Millsaps sur, dr shale 2200 ft.

COMPLETIONS

Chambers County — Humble's Barrow 1, South Cotton Lake area, abnd 8865 ft.

Walker County—E. J. Deu Pree's Texas Long Leaf Lumber Company 1, Mary Millsaps sur, abnd 3398 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—Paul Steed-E. L. Wilson & L. T. Burns' Prideaux 1, ne sw TE&L sec 1867, cem sur pipe.

Clay County—Deep Rock Oil Corp.'s Sal Dycus 1, se n½ TE&L sec 2602, rig.

Denton County — Seitz-Comegys & Seitz, Inc.'s Freeman 1, MEP&P sur A-1470, dd from 3507 ft, dr 3670 ft.

Montague County—Walter Gant et al's Laird 1, M. T. Millard sur A-470, dr 1220 ft.

COMPLETIONS

Clay County—F. H. Gohlke et al's Bunnenberg 1, sc 34, Pratts subd, abnd 1194 ft.

Jack County—B. C. Gilmore et al's Hoefle 1, T. D. Sporer sur, abnd 634 ft. Harper-Knappenberger et al's Marley 1, M. Mabin sur, abnd 3134 ft. H. R. Smith et al's Yates-Brant 1, J. Holderman sur A-268, abnd 2560 ft.

Montague County — Walter Gant-Continental's Brown 1, nw s½ se E. T. Ry. sec 58, A-1416 ft, Canyon 1450-2860 ft, Strawn 2860 ft, Bend 6077 ft, Mississippian 6390 ft. Simpson 6880 ft, Ellenberger 7290-7333 ft, used 42,000 gals acid in Bend, showed free oil, jkd. Tom Wade et al's McLaughlin 1, nw w 80 acres of e 190 acres, J. L. Graham sur, abnd 2981 ft.

EAST TEXAS

FIRST REPORT

Bowie County—Shell's Hall 1, John Downey sur, mir.

COMPLETIONS

Anderson County—Phillips Dr. Co.'s Hanks 1, 85-ac tr, W. C. Collingsworth sur, elev 449 ft, Pecan chalk 3006-3146 ft, Austin chalk 4110-4503 ft, Woodbine series 4884 ft, abnd 4916 ft.

Harrison County—Fohs Oil Co.'s Monte Hall 1, O. H. P. Bodine sur, abnd 4702 ft.

Rusk County—J. Z. Werby et al's McMillan-Humble 1, 98-ac tr, W. F. Allison sur, elev 344 ft, Pecan chalk 3158-3490 ft, Austin chalk 3811-4015 ft, Del Rio 4070 ft, Georgetown 4090 ft, abnd 4140 ft.

Ask 20-Acre Spacing for Orange Grove Field

Operators of the Orange Grove field, Jim Wells County, requested 20-acre spacing at a hearing before the Texas Railroad Commission last week. They asked that wells be located 330 feet from lease lines, and 933 feet apart, permitting wells to be drilled between if closer spacing proved advantageous.

Atlantic Refining Company asked that proration be on 75 percent acreage and 25 percent per well, with a maximum of 30 acres assigned to any well in the field.

Operators asked for a minimum of 950 feet of surface casing cemented to the surface, and an oil string set with a minimum of 350 sacks of cement. A maximum gas/oil ratio allowance of 2000/1 was recommended.

P. S. Schoeneck, geologist for Atlantic Refining Company, said production is found in the Pundt sand at 5100 feet, and that subsurface geology proved the Orange field is separate from Wade City, about a mile to the west. A fault with a throw of some 300 feet is located between the fields.

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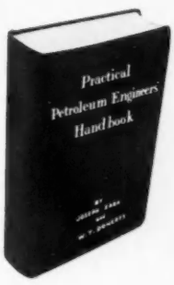

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This handbook was compiled and published for the purpose of saving the time of operators, engineers, superintendents, foremen and others.

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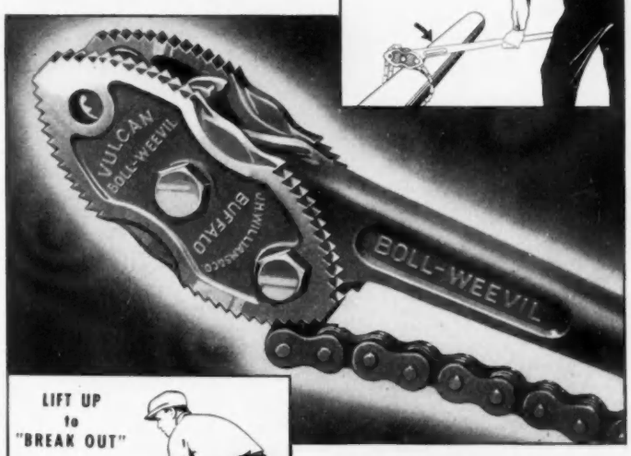

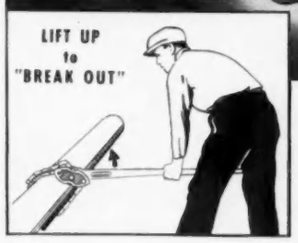

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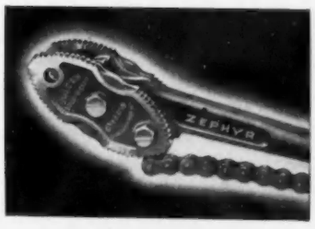

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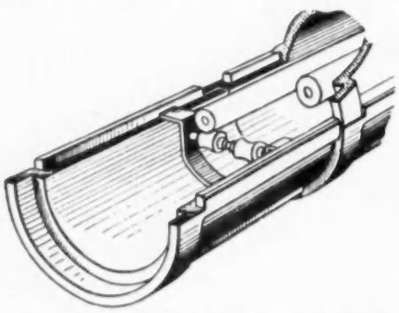

W. S. Dickey's Split Conduit Pipe

The pipe, made in 4-, 6-, 8-, 10-, 12-, 15-, 18-, 21- and 24-inch diameters, is vitrified and glazed, and has foundation burned in and the side socket sealed with asphalt to insure a tight joint.

The company has also announced an improved 4- and 6-inch glazed clay acidproof pipe for salt-water lines with a self-centering feature.

Pipe Straightener

SHAFFER TOOL WORKS

A portable pipe straightener for handling bent or kinked pipe at the well has been announced by Shaffer Tool Works, Brea, California. Hydraulically operated, it is mounted on springs attached to the axle and is equipped with a trailer hitch so it may be drawn with a light truck. The assembly is carried on automobile tires.

The unit is equipped with a ¾-horsepower AC or DC reduction gear motor, and may be obtained also with gasoline, gas or butane engines. Hydraulic power is supplied by an 8-inch diameter hydraulic ram actuated by a double piston pump with ¾-inch pistons and 4-inch stroke operating at 125 r.p.m. The ram is controlled by a valve, and when the pressure is released the return is made by heavy coil springs. Oil is used for fluid and is kept in a reservoir chamber.

The frame of straightener is conconstructed of two 15-inch 50-pound I-beams, 15 feet in length. It is designed with a side opening on the ram bracket which makes it possible to roll pipe on and off the machine. This eliminates handling the pipe through the end only. Each end of the straightener is equipped with stationary, adjustable jacks to level up and hold the machine in a stable position without use of wooden cribbing or other supports. Two portable roller stands are furnished, one for each end of the machine, and these are designed so that they can be raised or lowered to keep the pipe level throughout its length.

Clutch Facings

THE GATKE CORPORATION

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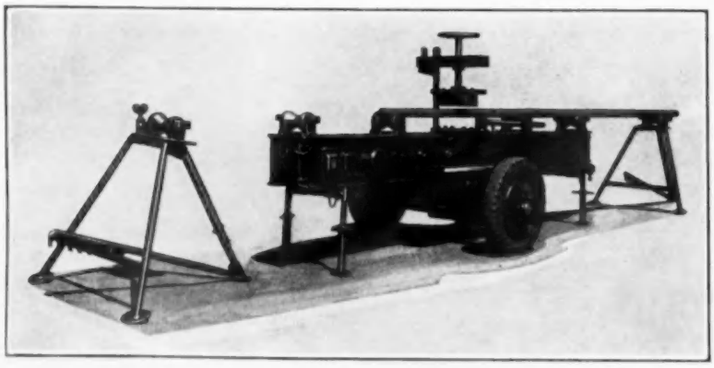
Gatke Clutch Facing

The teeth are moulded the full thickness of the facing to increase the wear area and eliminate wear to the housing. The facings are furnished in all sizes up to 30 inches in diameter.



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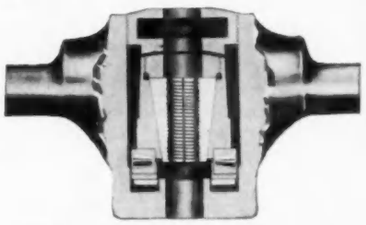
ADVANCED PETROLEUM EQUIPMENT CORPORATION

A sucker-rod rotator that rocks and rotates as it pumps, designed to remove strain and minimize wear and deterioration on sub-surface pumping equipment, has been announced by Advanced Petroleum Equipment Corporation, M. & M. Building, Houston.



"Apeco" Sucker Rod Rotator

The rotating and rocker motions combine to eliminate strain on polish rod, stuffing box and sucker rods by allowing free movement in all directions, compensating for stress or strain caused by the polish rod not traveling in a perfectly straight position.

The device is designed to alleviate fatigue to the point of arresting it when already set up by bending or vibration through allowing rods to drop more freely.

Roller Drive

WICHITA ENGINEERING COMPANY

A roller drive, designed to drive the kelly with rollers in drilling operations to keep it in alignment and increase its life, has been announced by Wichita Engineering Company, Wichita Falls, Texas.

Rollers on the drive are adjustable, designed to take up the slack of worn and irregular kellys with a tendency to slap, as well as to fit snugly against sides of regular kellys, and to permit the kelly to pass through the table freely and evenly while the table is in full motion.

It is described as affording the driller better control over the drilling weight of the string, permitting drilling and core bits to be fed into formations evenly.

The roller drive is constructed of abrasive-resisting alloy steel. Rollers are mounted on Timken roller bearings mounted in a sealed chamber to form a pack-off for the rollers.

Control Gate

SHAFFER TOOL WORKS

A double-cellar control gate for use where the vertical space available is so small that it is desirable to reduce even the very small space required for two single gates and the connecting spool between has been introduced by Shaffer Tool Works, Brea, California.

The two ram compartments comprising the gate are constructed with the upper compartment having rams to close around the pipe and the lower compartment equipped with rams for a

THE BETTER THE STEEL, THE BETTER THE BAIL

Bails must be hard in order to prevent premature weakening caused by rapid wear. But their toughest assignment comes because of the fact that their heavy loads are thrown on practically instantaneously.

Chrome-Molybdenum (SAE 4140) steel has precisely the qualities needed: hardness combined with strength, good yield point-tensile strength ratio and the requisite ductility. Bails made of it stand up for long periods in the worst sort of service.

Throughout the oil fields Molybdenum steels of various analyses are meeting the special requirements of many different applications with safety and economy. They are fully described in our free technical book "Molybdenum Steels in Oil Production".

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. . . uses two MacClatchie "Plastic Packed" Hydro-Seal Plug Valves, (3" or 4") . . . and two MacClatchie Adjustable Flow Beans. 3-point construction of top valve allows flow through EITHER or BOTH beans, or complete shut-off. MERELY BY ROTATING PLUG IN DIFFERENT DIRECTIONS! Full diameter round opening top to bottom for running swabs, light tools, etc., without removing tree from well head. Both valves "Plastic Packed" and lubricated with "Lubricheck" to assure easy turning, repacking and lubricating under pressure WITHOUT CLOSING THE LINE. Bean openings adjustable 1/64" to 1" volume area through venturi tube . . . larger sizes available. Unit easily shipped set up as shown . . . is compact (conserving space) and can be installed on tubing or casing head in a few minutes. Factory tested to 6000 lbs. Working pressure, 3000 lbs. Send TODAY for Complete Information!

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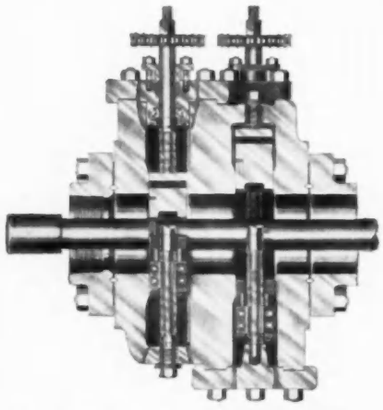
Rocky Mountain Representative, E. C. HILGARDE, Casper, Wyoming
Foreign, GEORGE B. WOODS, 17 Battery Place, New York, N. Y.

NOTES FOR THE Equipment Buyer and User



Shaffer Double Cellar Control Gate

complete shut-off when the pipe is out of the hole. The vertical space required by the double gate is approximately half that required for two single gates and their connecting spool. The double gate itself is less in height than two single gates alone.

The rams in the upper compartment are self-centering, and center small drill pipe in the bore of the gate as they close around it. They are made with protruding angular guides alternately top and bottom and as the rams move toward their closed position these guides engage the drill pipe and move it into central position in the ram. The angular guides telescope into the opposite ram block which permits the abutting faces of the ram blocks to seal perfectly. Ram rubbers may be either rubber or neoprene.

The upper compartment with the self-centering rams for closing around pipe has the end cover located at the front face of the gate body. On the inside of the end cover are bosses for the reception of annular thrust ball bearings. These bearings are an important factor in reducing friction caused by the end thrust on the collar of the operating screws caused by well pressure. The ram assembly in the upper compartment is removed from the front end, while the end cover for the removal of the ram assembly in the lower compartment is at the rear end of the gate.

Bolted to the front face of the gate are thrust plates with ball bearings for the operating screws of the lower gate. The extension of the operating screws of both the upper and lower compartments are on the same end of the double gate, and remote control can be used in the same manner as when two gates are used.

Gates can be furnished in sizes from 6⅝ to 11¾ inches, inclusive.

Spray Equipment

Eclipse Air Brush Company, 390 Park Avenue, Newark, New Jersey, has issued Catalog No. 77, a 32-page booklet covering its complete line of spray equipment for manual and automatic operation.

Oil Field Power

Caterpillar Tractor Company, Peoria, Illinois, has issued a 16-page booklet, "From Job to Job in the World's Oil Fields," showing various applications of its equipment in scattered sections of the United States and in foreign fields. The equipment covered includes five sizes of Diesel tractors, 3 sizes of spark-ignition tractors, 9 sizes of Diesel engines, 9 sizes of Diesel-electric sets, and 3 sizes of motor graders.

Anti-Leak Compound

Carbide & Carbon Chemicals Corporation, 30 East 42 Street, New York, has issued a 20-page booklet on Carboseal Anti-Leak, designed to correct bell-and-spigot joint leakage resulting from drying out and shrinkage of the jute or hemp packing in gas distribution systems. It incorporates essential facts presented in previous bulletins and technical papers on the subject, and discusses methods of applying the compound to meet various conditions existing in practice.

Welding and Soldering

The Imperial Brass Manufacturing Company, 1200 West Harrison Street, Chicago, has issued a 28-page booklet describing its line of welding and cutting torches and outfits, soldering outfits, gas and air torches, and lead-burning equipment.

Stoppers

R. W. Rhoades Metaline Company, Long Island City, New York, has issued a folder featuring laboratory stoppers of neoprene. It contains descriptions and specifications covering stoppers made of gray, red antimony and floating pure gum rubber. Also described are Kjeldahl stoppers and Bailey and Walter crucible holders.

Valves

Homestead Valve Manufacturing Company, Coraopolis, Pennsylvania, has issued a new 4-page folder giving a general description of its line of valves. Typical installations are illustrated, and a table shows the cost of steam, water and air leaks as compared to the cost of new valves.

Steam Cleaner

Homestead Valve Manufacturing Company, Coraopolis, Pennsylvania, has issued a 4-page bulletin on its Hypressure Jenny steam cleaner for maintenance and production jobs. The unit plugs in at an electric light socket, and is described capable of delivering steam for cleaning in 1½ minutes. A model to utilize plant steam lines is also available.

Nuts

Elastic Stop Nut Corporation, 2332 Vauxhall Road, Union, New Jersey, has issued a 4-page bulletin explaining construction and self-locking action of its line of stop nuts. Advantages claimed for their use are graphically illustrated.

NOTES FOR THE Equipment Buyer and User

Hugh Lamberth Joins Fluor's Cooling Tower Division

Hugh R. Lamberth has been named manager of the Cooling Tower Division of Fluor Corporation, Los Angeles. He will be in charge of cooling tower design, manufacturing and sales.

A. R. Lamberth

A native of Dallas, Lamberth is a graduate of the U. S. Naval Academy at Annapolis. He resigned from the Navy after a 3-year tour of duty and since has been associated with a number of nationally known firms. He came to the Fluor Corporation from Southern California Gas Company, where he was engaged in industrial engineering.

Wilson Supply Company Names Trinidad Sales Representative

Wilson Supply Company, Houston, has announced appointment of Neal and Massey Engineering Company, Ltd., Port of Spain, Trinidad, B.W.I., as engineering and sales representatives for the Nixon Surface Control Gas-Lift system.

American Chain & Cable Takes Over Julian d'Este

American Chain & Cable Company has announced acquisition of Julian d'Este Company, Boston, makers of pressure-reducing valves, liquid temperature regulators, tank and float valves, hot-water-tank regulators, pump regulators and relief valves.

Manufacturing operations are being shifted to American Chain & Cable Company's plant at Reading, Pennsylvania.

Linde Air Products Advances Cartledge, Bliss and Hayden

The Linde Air Products Company, unit of Union Carbide and Carbon Corporation, New York, has announced the election of T. D. Cartledge and L. A. Bliss as vice presidents, and of E. J. Hayden as vice president for the central division.

Cartledge has been general sales manager and Bliss, works manager of the company. Hayden has been manager of the company's central division.

E. B. Suydam, former assistant general sales manager, has been appointed general sales manager to succeed Cartledge, and P. B. Pew, former assistant works manager, has been appointed works manager to succeed Bliss.

Crawford Is Wickwire Spencer Buffalo District Sales Manager

Wickwire Spencer Steel Company, 500 Fifth Avenue, New York, has announced appointment of G. L. Crawford as Buffalo district manager in charge of sales of all products. He replaces A. G. Bussmann, recently promoted to general sales manager.

Crawford, who has been with the company since 1927, continues as sales manager of structural products, the position to which he was appointed in April, 1939. He is located at the company's Buffalo district sales offices, 70 Niagara Street.

Falk Dead

Otto H. Falk, board chairman of Allis-Chalmers Manufacturing Company, Milwaukee, died May 21 at the age of 74. After devoting 30 years of his life to the military, rising to the rank of brigadier general and serving as Wisconsin adjutant general, he retired to enter business. He was named receiver for the old Allis-Chalmers Company in 1911, and was named president of the reorganized Allis-Chalmers Manufacturing Company a year later.

Unit Rig & Equipment Obtains Additional Tulsa Facilities

Unit Rig & Equipment Company has purchased the Tulsa shop and equipment of Oil Well Supply Company, which, with its yard, covers an entire city block. The property has railroad facilities.

Unit Rig & Equipment Company organized less than five years ago by Hugh S. Chancey, William Guier and J. R. Underwood, has been constantly in-

This Tulsa property has been purchased by Unit Rig & Equipment Company

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210° Boiler Feed Water!

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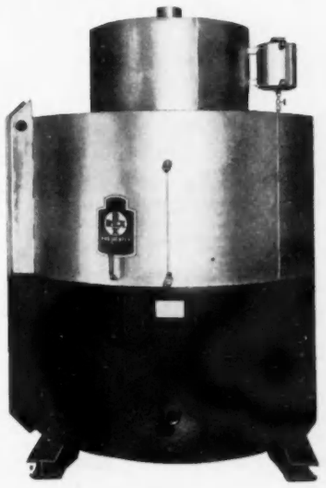

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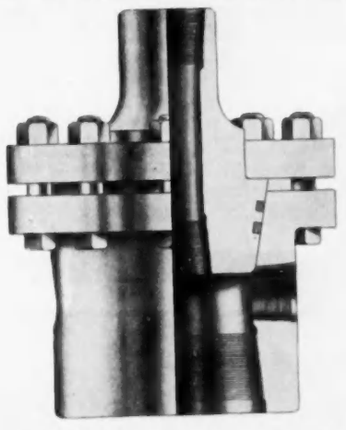
TUBING HEADS



Brewster Tubing Heads are made in every type and design, for controlling pressures from 2,000 lbs. to 10,000 lbs. Including mandrel, slip and stripper types. Let us have your requirements and we will be glad to quote. Special discounts on quantities.

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"For Better Cores" . . . see Failing . . . Experienced operators and improved equipment save you money on all types of exploration drilling . . . oil, sulphur, and other minerals.

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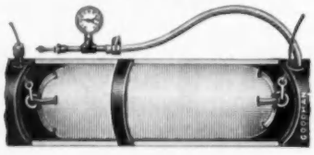
STOPPERS FOR OIL LINES



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NO-SMOKE
STANDCO BRAKE LINING
Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See Page 2100 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

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The knowledge gained through years of work and study by some of the most capable men in the oil industry is set down in the various oil books published and sold by the Gulf Publishing Company. Catalog of these books furnished upon request.

THE GULF PUBLISHING COMPANY
P. O. Box 2811 Houston, Texas

NOTES FOR THE Equipment Buyer and User

creasing its line of portable drilling and well-servicing equipment, making the expansion necessary. The firm recently introduced an Air-O-Matic clutch.

Bethlehem Steel Installs New Continuous Pipe Mill

A continuous mill for the production of butt-welded pipe, incorporating a number of new features, has been put into operation at the Maryland plant of the Bethlehem Steel Company. Pipe in sizes from ⅜- to 3-inch nominal diameter is produced in the mill, which is designed for rolling skelp from 1½ to 12 inches wide, in gages ranging from 0.068- to 0.312-inch. The rated capacity is 16 tons per hour. Construction work has also been started on a second unit, which will supply butt-welded pipe in a higher range of sizes.

The new facilities are housed in a 110 x 550-foot structure built entirely of protected metal, except for one side where the first 10 feet of the wall are brick. The floor is 6-inch concrete with a hardener on the surface. Two rows of windows on each side and a continuous sash in the monitor roof furnish an abundance of light and ventilation, with aluminum paint giving added brightness to the interior. At one end of the building is pipe storage, a 165 x 100-foot brick structure of high-low bay construction, with air-crete roof and monitor sash.

Due to continuous operation of the mill, the skelp is supplied in coils of 35- and 48-inch diameter, instead of in flat lengths. Depending upon the size of the pipe produced, these coils weigh from 600 to 2400 pounds each, and contain from 185 to 750 feet of skelp. They are delivered from storage, weighed and placed conveniently near the coil box. As needed, they are lifted into the coil box by means of an air-operated jib crane. The end of the skelp is passed through a roller leveler into an up-cut shear which trims the ends, if necessary. The skelp then goes to an electric flash welder where it is butt-welded to the end of the preceding coil, to form a continuous strip. A plow-type flash trimmer is used for removing the flash from the weld.

Depending upon the size of the skelp, the welding of a new coil to the preceding coil is completed in from 3½ to 17 seconds. To insure uninterrupted operation, the welder is placed at a distance of 10 feet from the roller leveler, allowing the skelp to be easily adjusted in welding, while a double looping bed immediately after the flash welder provides sufficient feed for the mill during the welding operation, while the end of the skelp remains stationary.

The looping bed is on the floor level and is paved with granite blocks which offer good resistance to wear by the skelp moving across it. It consists of a primary loop 162 feet long, and a secondary loop 55 feet long. Between the two loops is a pinch roll which keeps the skelp moving from the primary into the secondary loop. A pair of limit switches actuated by the secondary loop controls the action of the pinch rolls to maintain this loop of constant length.

The heating furnace is 147 feet long and has a heating chamber 21 inches high, 2 feet, 3 inches wide at the top and 18½ inches wide at the bottom. It is equipped with 274 nozzle-mixing burners spaced at 9-inch centers the full length of the furnace, except for a 30-foot section at the charging end, which serves as a preheating zone. The burners are arranged in groups of 11, connected to a common header. Each burner has a small gas cock and a blast gate for adjusting the preheated air, thus providing individual burner adjustment. Total burner capacity is about 100,000 cubic feet of 500 B.t.u. mixed gas per hour, delivered at 4- to 8-ounce pressure.

In the preheating zone, the skelp is carried on three alloy-steel rolls and three water-cooled plain-steel rolls. These have individual chain and sprocket drives, a 5-horsepower motor serving all rolls to prevent stopping of all rolls in case of chain failure. In the heating zone, the skelp slides over 12 water-cooled skid pipes, which can be removed and replaced without interrupting the operation of the mill. A hole, covered with an 18 x 9 x 3-inch tile, is provided in the furnace roof sections, directly over each skid pipe.

At the entrance of the furnace is a door lined with fire brick, at the discharge end a water-cooled door of structural plates, sliding in water-cooled buck stays. This door has a control opening through which the skelp passes. In addition, a supplementary water-cooled door is provided. By adjustment of the two doors it is possible to obtain a reasonably tight top and bottom closure.

As the skelp passes through the furnace, the flames impinge directly upon the edges, bringing them to welding temperature, close to the softening point. The central portion of the strip, however, does not reach this temperature and consequently retains sufficient mechanical strength to withstand the pull exerted by the welding rolls as these draw the skelp through the furnace. This condition differs radically from that encountered in the conven-

Elastic Stop SELF-LOCKING NUTS

FOR drilling, pumping, and other oil field equipment. Resilient locking collar prevents working loose under any condition of vibration or stress. Available in numerous types, all sizes, all standard threads, and any material. Get them from your supply house.

FACTORY STOCKS IN HOUSTON AND LOS ANGELES
Safe . . . Reliable . . . Economical
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ELASTIC STOP NUT CORPORATION
2320A VAUXHALL ROAD • UNION, NEW JERSEY

NOTES FOR THE Equipment Buyer and User

tional welding furnace used in heating cut lengths of skelp.

As the heated skelp leaves the furnace it is drawn through a series of six roll passes, consisting of three pairs of horizontal and three pairs of vertical rolls. The first roll pair takes the place of the forming bell of the conventional butt-welding mill, while the welding takes place in the remaining five roll pairs. To intensify the heat at the weld and to blow off scale, a blast of air is directed against the edges of the skelp as it emerges from the furnace.

Skelp, leaving the heating furnace at Bethlehem Steel Company's new continuous mill for butt-welded pipe, passes through forming and welding rolls, followed by a flying hot saw. Operations are controlled from pulpit in foreground.

As the pipe leaves the rolls it passes a flying hot saw where it is cut to the exact lengths desired. The saw travel is driven from the welding mill motor and is synchronized with the speed of the pipe.

From the saw the cut lengths pass over a narrow cooling rack, of the chain and sprocket type. It is then carried by a short conveyor to a sizing mill and descaler, where the scale is cracked loose both from the inside and the outside, and where the final size is obtained. This is followed by a second cooling rack of the same type as the first, but 30 feet long. The pipe is then ready for the regular finishing operations.

The continuous process permits a closer temperature control than is possible in the old method of butt-welding. This is due to the burner arrangement, the small cross-section of the heating chamber, and the rapid travel of the skelp. On account of the shorter heating time, the scale losses are also greatly reduced. Due to these factors, it is possible to produce a pipe of higher quality, with uniformly sound weld.

Potentiometers

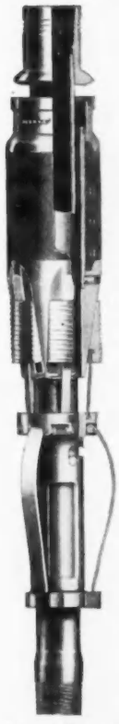
Leeds & Northrup Company, 4934 Stenton Avenue, Philadelphia, has issued a 24-page illustrated catalog describing its Types K-1 and K-2 potentiometers, galvanometers and other accessories. Included is a description of the thermionic amplifier to adopt potentiometers to measurements in high-resistance circuits, such as those for pH measurements using glass electrode.

Metalizing

Metallizing Company of America, 562 West Washington Boulevard, Chicago, has issued a new 16-page booklet on its metalizing process, giving information on its Mogul Model P and Model S metalizing guns. It describes the process, and illustrates the use of the guns.

MERLA

Made for Deeper Wells . .



Insert Pump
Anchors
Packers
Flow Valves
Swabs

What's so different about MERLA Packers? If you are being forced to lower levels for production you know from experience that packer performance counts heavily. Ever deepening wells call for double tough, reliable equipment that does the job.

Before you buy packers again weigh these outstanding features in the MERLA Improved Hookwall Packers: (1) Positive non-leaking valve on valve in head type; (2) Special reinforced packing sleeve; (3) Five slips for balanced pressure distribution against the casing; (4) Slips dovetailed to the cone; (5) Slips and packing sleeve assembly free swiveling in cage; (6) No rivets or welding on the slips or slip reins; (7) Friction springs are hinged to the cage; (8) Rugged all steel construction with the exception of malleable cage. Our engineers will be glad to advise you in your production problems.

Ask MERLA for information on their other line of Packers.

Merla Packers covered by U. S. Patents 2,084,611, 2,131,274, 2,131,275, 2,132,723, 2,136,674—other patents pending.

See Pages 1642-1643 Composite Catalog.

EXPORT: FRICK-REID SUPPLY CORP. 230 Park Ave., New York, N. Y.

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Manufacturers of Oil Field Equipment
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THROUGHOUT the WORLD

Demands for wells to be drilled-in under pressure keep Otis drilling head operators a-hoppin'. They've completed about 3,000 wells—including 95% of those in the Oklahoma City Mansion Area—since Otis Pressure Control pioneered with this method.

Centralia, Illinois is the latest field to call in Otis equipment. A major company operating there was so pleased with the performance of the Otis Square Kelly Drilling Head in drilling-in the largest well in the field, that they made Otis' the standard method of completion in that area.

Advantages of Otis pressure drilling equipment include: sure prevention of blowouts in drilling-in or cleaning out under pressure; permits accurate logging of each foot of formation as it is being drilled; means of obtaining unbroken cores of the producing formation for laboratory tests; allows a controlled rate of flow from the time the producing horizon is penetrated and carries excess pressure on the mud column.

Otis pressure-control drilling equipment includes an Otis Square Kelly Drilling Head, Otis Pressure Operated Union and Pressure Operated Oil Saver. Each unit has a specific purpose to accomplish so that the work can not satisfactorily be done with any one piece of equipment.

Yet, you may have the benefit of this peerless method and Otis' unequaled experience without having to invest in the equipment—it is available at a newly reduced daily rental charge. The equipment is always reliable and kept in top-notch condition by Otis service men. You may obtain 24-hour supervision if you wish. Equipment is sold outright to export trade only.

OTIS "Don't Kill Your Well" Call OTIS

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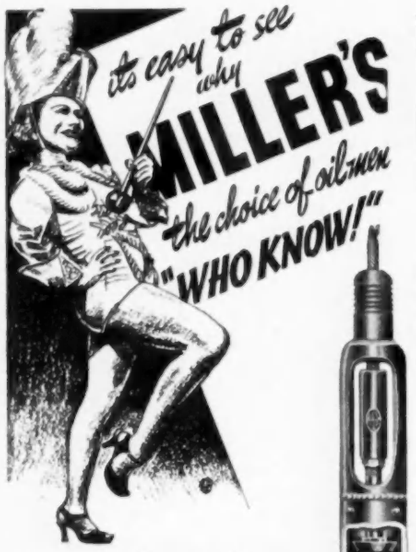


You too, will agree the powerful suction action of the MILLER Sand Pump, cleans-out sand and sediment faster — that's why it's the Sand Pump oil men 'round the World are using to increase production.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type. ¼-inch wall tubes HEAVY DUTY Sand Pumps.

INTERCHANGEABLE BOTTOMS

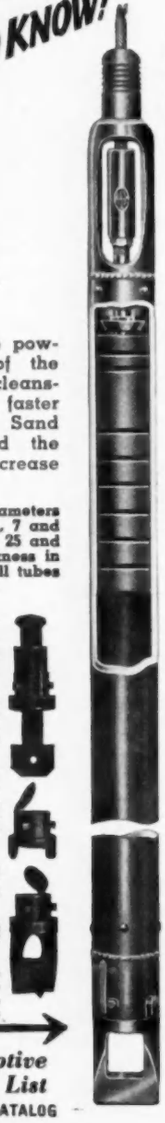
To Meet Every Condition

● **BAILER BOTTOM**
With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.

● **SAND BOTTOM**
Used when tools are run and when well is shot to quickly remove loose material.

● **STAR BOTTOM**
Used for cutting the sand loose.

● **CHISEL BOTTOM**
(In Pump)
With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.



Write for Descriptive Folder and Price List

See Pages 1672-73 COMPOSITE CATALOG

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Precaution

How did you learn to use both hands equally well?

Shure now and me faether, he always said to me: Pat, learn to cut your fingernails with yure left hand, fer some day ye might be afther losing yer right hand.

Shake

"My girl has remarkable talents."

"My girl isn't so good-looking either."

Western Hospitality

A lady, touring the west, was struggling with a cup of hot coffee in the lunch counter before her train pulled out. A cowboy noted her plight.

"Here, ma'am," he offered, "you take my cup o' coffee. It's saucered and blowed."

Case Study

"Beg pardon, sir, but I have eaten nothing for a week."

"I say, that's interesting. Come back later and tell me how long you were able to hold out."

Vital Omission

The doctor examined him twice a year. He wore galoshes when it rained. He slept with his window open. He stuck to a diet with plenty of fresh vegetables. He got at least eight hours' sleep every night. He never smoked, drank, or lost his temper. He did his daily dozen. He was all set to live to be a hundred.

The funeral took place yesterday. He had forgotten about automobiles.

Mrs. Clancy Obliges

Canvasser—Madame, will you donate something to the new hospital?

Mrs. Clancy (who has just finished an argument)—Well, ye might step in an' take a look at Clancy. Maybe he'd do.

Outspoken

"How many of the girls in the sewing circles are in on the secret?"

"Ten, all told."

"They would."

Opportunity

"I see dark spots in front of my eyes."

"Good; let's park in one of them."

The Wise Judge

"What do you think of my new hat?" asked the judge's wife of her husband.

"I will reserve decision until I see the bill," was the guarded reply.

Double Duty

The bootmaker so prided himself on the quality of his work that he guaranteed each pair of boots to last six months.

A man returned with a pair of boots that had worn out in three months.

"What's the matter with them, don't they fit?"

"Yes, they fit well enough on me, but they're a bit tight for my brother on the night shift."

Flowers

Mrs. Newrich was fond of flowers and especially liked the salvia, but was not very reliable in getting the names right.

She was giving directions to her gardener: "On this side of the walk," she said, "I want you to put out some salivas. Now what would you suggest for the other side?"

"Well, madam, maybe it would be a good idea to put some spittoonias there."

Preliminary

Dentist: "Stop waving your arms and making faces, sir. Why, I haven't even touched your tooth."

Patient: "I know you haven't, but you're standing on my corn."

No Limit

"And now, gentlemen, I should like to tax your memory."

"Good heavens, has it come to that?"

Spoke to Him

A man and his wife were suffering from seasickness, while their young son became more rowdy by the minute. Finally, the mother mustered courage and voice enough to say:

"John, I wish you would speak to Willy."

The father, unable to lift his head, said feebly: "Hello, Willie."

Utensil

"How did you like those Chinese back-scratchers I brought you?"

"Is that what they were? Chinese back-scratchers! My wife's been making me eat salad with them!"

Not a Vice President

"What position did you hold in your last place?"

"I was a doer."

"What's that?"

"When my employer wanted anything done he would tell the cashier, the cashier would tell the bookkeeper, the bookkeeper would tell the clerk and the clerk would tell me. As I hadn't anyone else to tell it to, I'd do it."

No Risk

"If you loved me, why did you refuse me at first?"

"Just so see what you would do."

"But I might have rushed off without waiting for an explanation."

"Hardly, I had the door locked."

Satisfied

A couple skidded around a corner, knocked down a lamp post, smacked three cars, ran against a stone wall and stopped. Slowly the girl climbed out of the wreck.

"Darling," she exclaimed, "that's what I call a kiss."

This Is an Old Joke

"And did you know I am sending my daughter abroad to study singing?"

"No, I didn't, but it's very thoughtful of you."